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LIST OF ACRONYMS AND ABBREVIATIONS

AHS-1	Adventist Health Study number 1
AHS-2	Adventist Health Study number 2
AIHW	Australian Institute of Health and Welfare
ALA	American Library Association
AMA	American Medical Association
AMIA	American Medical Informatics Association
BMI	Body Mass Index
BT	Broader Term
CAM	Complementary and Alternative Medicine
CCOHS	Canadian Centre for Occupational Health and Safety
CDC	Centers for Disease Control and Prevention
CDP	Chronic Disease Prevention
CD-ROM	Compact Disc Read Only Memory
CGI	Common Gateway Interface
CHI	Consumer Health Informatics
CHIP	Coronary Health Improvement Program
CHV	Consumer Health Vocabulary
CIRCLE	Curriculum and Instruction Resource Center Linking Educators
DBMS	Database Management System
DPAS	Diet, Physical Activity and Health
EC	European Community
ELM	Elaboration Likelihood Model
ENWHP	European Network for Workplace Health Promotion
E-R	Entity-Relationship
ERIC	Education Resources Information Center
EU	European Union
FAQ	Frequently Asked Questions
FDA	Food and Drug Administration
GDP	Gross Domestic Product

HE	Health Promotion and Education Database
HHS	Department of Health and Human Services
HMOs	Health Maintenance Organisations
HON	Health on the Net Foundation
HP	Health Promotion
HSM	Heuristic-Systematic Model
HSWG	Health Summit Working Group
HTML	Hypertext Markup Language
IA	Information Architecture
ICD-9	International Classification of Diseases, Ninth Revision
ICTs	Information Communication Technologies
IDF	International Diabetes Federation
IOM	Institute of Medicine
IOTF	International Obesity Task Force
ISP	Internet Service Provider
ISP	Information Seeking Process
IT	Information Technology
K-12	Kindergarten-grade 12
LC	Library of Congress
LCSH	Library of Congress Subject Headings
MARC	Machine Readable Cataloging
MeSH	Medical Subject Headings
MLA	Medical Library Association
MRC	Medical Research Council
MySQL	My Structured Query Language
NCCAM	National Center for Complementary and Alternative Medicine
NCCDPHP	National Center for Chronic Disease Prevention and Health Promotion
NCHS	National Center for Health Statistics
NCI	National Cancer Institute
n.d.	No date

NEWSTART	Nutrition, Exercise, Water, Sunlight, Temperance, Air, Rest, Trust in divine power
NIH	National Institutes of Health
NISO	National Information Standards Organisation
NLM	National Library of Medicine
NNLM	National Network of Libraries of Medicine
NT	Narrower Term
OAM	Office of Alternative Medicine
OCLC	Online Computer Library Center
ODBC	Open Database Connectivity
PATH	Profiles of Attitudes Towards Health Care
PC	Personal Computer
PCP	Professional Care Practitioner/Provider
PDA	Portable Digital Assistant
PHP	PHP: Hyptertext Preprocessor
RCT	Randomized Controlled Trial
RT	Related Term
SAU	Southern Adventist University
SDA	Seventh-day Adventist
SNOMED	Systematized Nomenclature of Medicine
START-A-NEW	Sunshine, Temperance, Air, Rest, Trust in God, and Nutrition, Exercise, Water
STEPFAST	Sunshine, Temperance, Exercise, Proper diet, Fabulous water, Air, pure and fresh, Sleep, Trust in God
TCP/IP	Transmission Control Protocol/Internet Protocol
UF	Used For
UICC	International Union Against Cancer
UK	United Kingdom
UMLS	Unified Medical Language System
URL	Uniform Resource Locator

U.S.	United States
USB	Universal Serial Bus
WELLNESS	Water, Exercise, Life in balance, Loving relationships, Nutrition, Enjoy adequate rest and relaxation, Sunlight and fresh air, Stress management
WHO	World Health Organization
WWW	World Wide Web
XML	Extensible Markup Language

CHAPTER ONE

GENERAL ORIENTATION AND PROBLEM FORMULATION

1.1 INTRODUCTION

This thesis reports on the design of a prototype database-driven web site of health information resources to facilitate informed lifestyle choice. The burden of chronic disease and related lifestyle factors, the increasing interest in health information on the Web and the potential of health information for the support of informed lifestyle choice interest the researcher, as information professional. The potential of health information contributing to a more informed society, when it is made accessible, is of significance in the context of the current health care situation and the emergence of a new worldview (Anhoj & Jensen 2004; Barnes *et al* 2004; Blustein 2005; Chin 2000; Korp 2006; Schuster *et al* 2004a). Access to health information on the Web has the potential to empower ordinary people and give them some control over their lives. It could also be disempowering as information accessed could be useless, unproven, biased, unauthenticated and even harmful, hereby negatively impacting society. Personal empowerment has the potential to contribute to a more healthy society (Feather 2006:6; Korp 2006:79).

The information professional has the knowledge and skills to identify and profile a specific user group that value health information for making informed rational choices and decisions about their health and lifestyle. In the current milieu, the establishment of criteria by which to select resources to support the information need of the health information seeker, together with the design of a user-centred database-driven web site, are important contributions.

1.2 BACKGROUND TO THE STUDY

As subject librarian for the Health Promotion (HP) programme at Helderberg College in South Africa, the researcher became aware of the need to design

and develop a database that would make rational therapy resources available and accessible. Its purpose was to support the search for and retrieval of resources by the programme's students and staff. The original study was titled *The design of a database of resources for rational therapy* (Steyn 1999). Annexure one is a summary of the original study and provides a background for this study. When the opportunity arose for further study, the researcher made a decision to continue with the original study (Steyn 1999). It was important to establish whether the extended model, as outlined in Figure 6.1, Annexure one, was suitable for implementation if the recommendation by the user to make it 'available on the Internet' would be followed.

Consideration of the extended model, in the context of an analysis of the reported literature, indicated that since the original study was undertaken, the growth of the Internet and the Web has impacted health information-seeking behaviour and health information delivery systems. The Web has changed the way in which information can be made available. This has significant implications for the design process. These include understanding the current health care situation, the user as health information seeker in the emerging new worldview and determining how the conceptual schema designed in the original study and set out in Annexure one can best be made available on the Web in a user-centred design.

According to the extended model (annexure 1), the first step is 'choice of software'. A software-based database would limit access to a stand-alone database locally available to a small group of users. The Web would make the resources available worldwide to anyone seeking health information. The decision was therefore made to design a database-driven web site rather than a software-based database. Reflection on the design process, in light of the extended model, indicated that the choice of a database host instead of a choice of software were important aspects to be researched. In light of these considerations, it was important to delimit this study to the design phase of a database-driven web site. A new model that would incorporate the choice of a database host and the design process of a web site was developed. The model is presented as Figure 1.1.

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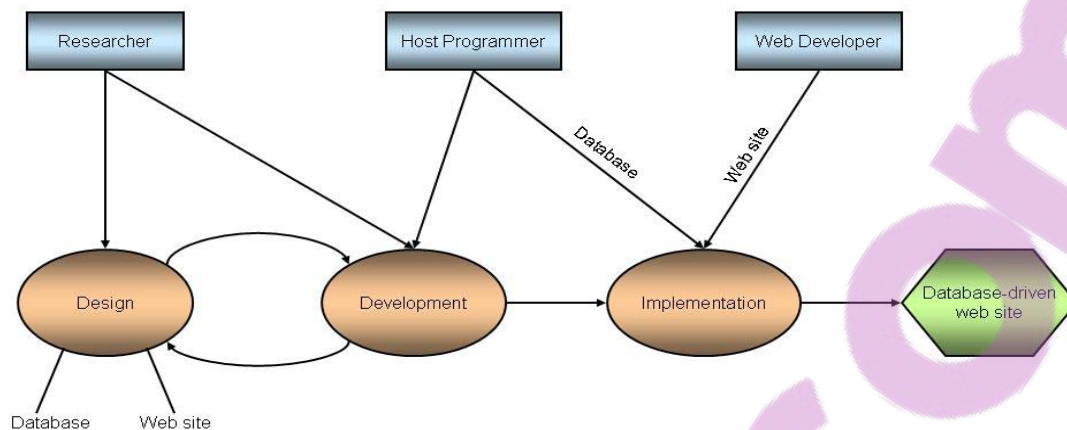
Figure 1.1 Database-driven web site development model

The model comprises three phases:

- design – focus of this study
- development – recommendation for further study (chapter 8)
- implementation – recommendation for further study (chapter 8).

The interrelated components of the database-driven web site are the user, the resources and the tool. These need to be understood in the context of the design process. The researcher is concerned with the user and his/her information need in the emergence of a new worldview that characterises the current health care situation; with the selection of information sources and resources; and with the design and delivery of, and accessibility to quality, relevant and credible health information. Using appropriate tools and resources to satisfy user requirements, the researcher, as information professional, can contribute to an informed society by making health information accessible.

An analysis of the literature researched (Anderson 2004; Breslow 1999; Chin 2000; Chu 2003; Cline & Haynes 2001; Craig 2005b; Eisenberg *et al* 1993; Eysenbach 2002; Eysenbach 2000; Eysenbach & Jadad 2001; Ferguson & Frydman 2004; Forkner-Dunn 2003; Fox 2006; Fox & Rainie 2000&2002;

Gordon 2004; Health Informatics Community 2006; Hildreth & Elman 2007; Hirji 2004; Hirschkorn 2006; Hogle 2002; Hyman 2005; Jamner & Stokols 2000; Kent 2003; Korp 2006; Lancaster 2003; Lupton 1997; NCCAM 2004; Poensgen 2001; Risk & Dzenowagis 2001; Schuster *et al* 2004a&b; Sointu 2006; Tyson 2000; WHO 2005a) evidenced particular trends in the current health care situation and the emergence of a new worldview. These impact the study of the user, the resources and the tool. The trends include:

- paradigm shift and emergence of a new worldview in health care
- burden of chronic disease
- limitations of conventional medicine
- rise in interest and use of complementary and alternative medicine (CAM)
- increased focus on HP and disease prevention
- seeking for optimal health, that is wellness
- empowerment - that is informed lifestyle choice
- disempowerment (for example gap between 'information-rich' and 'information-poor' and levels of health literacy)
- compounding of existing social divisions and inequities in access
- assuming personal responsibility for health
- challenges to the expert (doctor)-lay person (patient) relationship
- information intensiveness of health care
- Web and information communication technologies (ICTs) make an extensive amount of medical information, interactive services, as well as health sites focusing on healthy lifestyle issues accessible and available contributing to paradigm shift
- health on the Web (e-Health) and user as health consumer (e-Type)
- health informatics and consumer health information (CHI)
- healthism (health as integral part of everyday life actively sought) promoted by the Web and commercialisation of health information and products
- health consumers searching for information to make health decisions

- specific group seeking for health information, that is health information seekers

- the transition from user as patient to reflexive consumer to health information seeker

- transition from lay person to lay expert

- enabling of advanced information and knowledge retrieval

- user experience and expertise assumes the patient is better/worse informed and knowledgeable

- ability to look for information and answers to questions in an individual way, anonymously, at own pace, conveniently

- quality and credibility of information, as well as privacy and confidentiality and lack of evaluation of information

- shift towards the expert control and evaluation of sources of health information, that is medical bias

- creation of social contacts and support independent of time and space.

The implications of these trends are that the Web is a preferred source of health information and there is a need for information to take personal responsibility and make informed choices about wellness (Korp 2006:80). On the one hand, this is conducive to providing opportunities for people to search for and access valuable information in a convenient and personalised way. On the other hand, much of the information may be useless, unauthenticated, unscientific and of poor quality. Research of these trends and how the researcher as information professional can respond supports the relevance of this study (section 1.5). An analysis of the trends highlighted the user's need for health information to take personal responsibility for health and make informed lifestyle choices.

In the original study (Steyn 1999), the researcher established that the user need and requirement was for health information reflecting a particular approach to wellness that was termed rational therapy. In this study, the approach will be termed WELLNESS, as explained in section 4.2. WELLNESS is an acronym that encompasses eight essential components

that constitute a lifestyle which, in balance, will achieve a state of wellness (Craig 2005b:3). These include the use of **W**ater, **E**xercise, **L**ife in proper balance, **L**oving and supportive relationships, **N**utrition of a good quality and appropriate quantity, **E**njoying adequate rest and relaxation, **S**unlight and fresh air and **S**tress management.

The background to this study established the user need for a database-driven web site of WELLNESS health information resources. It was important to research whether there were any related research projects reflecting this approach.

1.3 RELATED RESEARCH PROJECTS

After an extensive search on the 'user', 'resources' and 'tool' in available national (Current and Completed research, ISAP By the National Library of South Africa, KOVSIDEX, NDLTD [Theses and Dissertations], NEXUS, SACat, SANB, UCTD) and international (ABI/Inform Global, Academic Search Premier, ACM Digital Library, Alt-Health Watch, ArticleFirst, CINAHL Plus with Full Text, Digital Dissertations, Education Research Complete, Emerald, ERIC, Google Books Search, Health Source: Nursing and Academic Edition, Health Source: Consumer Edition, Health and Wellness Resource Center, Health Reference Center - Academic, IEEE Computer Society, IngentaConnect, Journals@Ovid Full Text, JSTOR, Lexis-Nexus Academic, Library Literature and Information Science Full Text, Library, Information Science & Technology Abstracts, Library and Information Science Abstracts, MEDLINE, MEDLINE Plus, NetLibrary, Proquest Dissertations and Theses, PsychARTICLES, PsychBOOKS, PsychINFO, PubMed, ScienceDirect, Social Sciences Citation Index, Web of Knowledge, WilsonSelect Plus, WorldCat) databases from July 2003-December 2007, it became evident that research in the following related areas is ongoing and reinforced the need for and the timeliness of this study:

- health care situation

- health care on the Web (e-Health)

- health information and resources on the Web

- health literacy

- CHI

- the user as health information seeker in terms of search and retrieval behaviour, search processes

- information representation and retrieval

- vocabulary control

- construction of thesauri

- web site design and evaluation

- selection criteria and quality control

- lifestyle and wellness as optimal health factors.

It was concluded that this is a unique research study in that the framework for making WELLNESS resources accessible reflects an orientation that is not currently available on the Web. Attention is given to one or more of the eight lifestyle factors of WELLNESS on various web sites, for example exercise (http://www.justmove.org) and nutrition (http://www.eatright.org), but there is a need to address all eight components from a wholistic perspective of wellness in a targeted web site. This study aims to design a prototype WELLNESS database-driven web site to meet this need.

The research of related research projects evidenced that the need for online health information is increasing and that health information is more accessible. However, the user has not been profiled as the WELLNESS health information seeker. There is not a dedicated web site that will make WELLNESS resources accessible.

The researcher identified problems that require investigation and possible solutions that will be addressed in this study.

1.4 PROBLEM STATEMENT

The context of this study is the paradigm shift within health care and the emergence of a new worldview as reflected by the user as health information seeker. It is important to make health information available on a database-driven web site from a WELLNESS approach for making informed personal lifestyle choices. The following questions incorporating the user, resources and tool form a framework to inform this study:

- who is the WELLNESS health information seeker and what is their information need?
- what resources will be selected in order to meet the WELLNESS health information seeker need and requirements?
- how will the tool be designed to make WELLNESS resources accessible and available to satisfy the WELLNESS health information seeker's information need?

The following issues emerge as sub-problems that should also be addressed:

- what is the relevant body of information concerned with wellness and more specifically the information that undergirds the WELLNESS approach?
- which criteria are relevant for the purpose of selection of WELLNESS information resources?
- what is the most appropriate medium for mapping the conceptual schema?
- what vocabulary will be used to compile a thesaurus to facilitate retrieval and accessibility?
- what is user-centred web site design?
- how can the database-driven web site contribute to the credibility of the WELLNESS approach to wellness and health?
- how can health information resources contribute to a more informed society by supporting informed lifestyle choice?

The issues raised in the problem and sub-problem statements provide a framework for the study. The emphasis is on making information accessible. This reinforces the importance of the expertise, knowledge and experience of the researcher as information professional. This highlights the fact that the study is timely, essential and relevant.

1.5 RELEVANCE OF THE STUDY

An analysis of the literature researched evidenced particular trends in the current health care situation which impact on the study of the user, the resources and the tool. It highlighted the importance of the information professional to make a contribution to a more informed society in which individuals take more personal responsibility for lifestyle choices. An analysis of the literature (Chu 2003:12; Dalrymple 2005:525, 531, 537; Feather 2006:3-9; Lancaster 2003:337; Perry, Roderer & Assar 2005:205; Powell & Clarke 2002) suggests the following information professional roles:

- facilitate access to information
- deliver information when and where it is needed in formats that increase usage
- deal with the impact of the Web
- information representation and retrieval
- categorisation of resources
- make users aware of range of information resources available to ensure best use of time and resource
- provide skills and tools to user to seek, find, select, evaluate and use information
- provide focused and accurate information
- creation of information content using digital information and technology
- acquisition, organisation and dissemination of information
- observing information gathering behaviour and identifying user criteria
- developing information retrieval systems that meet user criteria
- provide robust search mechanism

- help users become information literate
- become part of a multidisciplinary team providing information
- using specialised vocabulary or language
- developing indexing filters
- provide user-friendly front ends in web design
- provide high quality, well-informed, comprehensive metadata
- collaborating to solve research problems
- providing knowledge-based information to clinicians
- development of information management skills
- selecting the best information to fit the need
- analysing information and information needs
- tagging articles to identify the type of research reported and whether standards of randomised controlled trials (RCT) have been met or not
- keeping practice connected to theory and research
- keeping abreast of research findings
- make a contribution to the health information infrastructure.

The researcher, as information professional, has identified the opportunity to use her knowledge, expertise and skills to respond to the emergence of a user group characterised by their need for health information that allows them to make informed lifestyle choices within the context of the current health care situation. The user requirement for health information resources, together with the increased use of the Web for health information, can be met by the provision of access to WELLNESS health information resources in a WELLNESS database-driven web site.

During the period 1997-2007 in which the researcher has been involved in a study of the trends in health and healing, in HP and the importance of wellness, prevention and the important role of information, many relevant issues have been observed. These include epidemiological, philosophical, epistemological, sociological and psychological relevance.

1.5.1 Epidemiological relevance

The correlation between chronic disease, lifestyle behaviour and risk factors has increasingly become a matter of the importance of informed choice and personal responsibility in wellness, the promotion of health and prevention of these diseases. This has called question on the dominance of the conventional medicine definition of disease, its aetiology (causes or origins), approach to treatment, lack of attention to health and the importance of the 'patient' in combating this global problem that is reaching epidemic proportions. It has also accommodated those factors recognised by CAM as important in HP and wellness while emphasising the importance of science and research. WELLNESS - the use of water, exercise, life in proper balance, loving and supportive relationships, nutrition of a good quality and appropriate quantity, enjoying adequate rest and relaxation, sunlight and fresh air and stress management - is critical to a lifestyle that is wholistic, balanced and oriented towards wellness (Breslow 1999:1030-1033; Breslow 2000:41; Craig 2005b:5; Schuster *et al* 2004a:351; Willis 1997:269). It has been shown (Dutta-Bergman 2005; Fox 2006; Godin, Truschell & Singh 2005; Griffiths *et al* 2006; Madle *et al* 2004; Morahan-Martin 2004; Nicholas *et al* 2003; Potts 2006; Wantland *et al* 2004) that increased interest in and accessibility of health information on the Web has the potential for increasing knowledge, supporting health behaviour, change of attitude and lifestyle. This study therefore has relevance in the context of the global epidemic of chronic disease and the fact that lifestyle behaviour and choices have been shown to be correlated with risk factors. The goal is to develop a WELLNESS database-driven web site of resources to support the promotion of a healthy lifestyle and making rational, informed choices about health.

1.5.2 Philosophical relevance

Patients', practitioners' and health care consumers' ideas and values reflect and represent various worldviews. These influence health information-seeking. Coiera (2004:1197) suggests that health care is shaped by the beliefs and values of a culture. Health practitioners reflect a worldview in the

way they practice. The challenge of CAM (new paradigm) to conventional medicine (old paradigm) is partly due to shifts in worldview towards self-care and personal responsibility for health as explained in section 2.2. Researchers (Astin 1998; Barnes *et al* 2004; Chin 2000; Eysenbach 2002; Eysenbach & Jadad 2001; Fox & Rainie 2000; Korp 2006) of CAM have identified that factors such as faith, prayer, belief and trust are not just placebos, but that spirituality is significant in the personal pursuit of health and healing and choices made about practices and procedures. The resources selected to be included in the database-driven web site will reflect a particular approach, that is WELLNESS and worldview. Sections 2.2.4 and 4.2 will discuss the WELLNESS approach and worldview. The model of selection criteria, as outlined in Chapter four, should include worldview as an important criterion to enable both the information provider and user to support choice and discernment in the selection of health information. Therefore, worldview is an integral aspect of the discussion of health and healing and is relevant because of the emergence of a new worldview, the role of the Web for health information and the impact of these on the interrelationship between the user, the resources and the tool.

1.5.3 Epistemological relevance

The relevance of this study is that living in an information age requires that information professionals address the concerns raised in various areas of information, of knowing, knowledge and decision-making, and in this case health information. Discernment and the importance of a rational, informed approach to one's lifestyle are critical (Agwunobi 2006; Craig 1999; Fuhrman 2003; Jacobson 2005; Maxwell 1998; Meadows 2003; Shine 2001; Watson & Platt 2000; WHO 2005a & 2005b). With the growth of health information on the Web, there is concern about the lack of control due to the fact that anyone can host a web site or make information available. Sections 4.3 and 4.4 evidence the focus increasingly being placed on the importance of credible, current and accurate health information resources in the vast amount of literature written on the subject. There is tension between conventional medicine and CAM about legitimacy, science and the profession (Hirschkorn

2006; Korp 2006; Morreim 2003). Quality assurance is a key to both the provision of resources and to the development of discernment by the user. There has been a shift from the dominance of the medical practitioner, doctor or clinician as prime information provider towards the reflexivity of the consumer of health information, as discussed in sections 1.9, 2.3.1 and 3.4.3, and the role of the Web in making information accessible and available, thus supporting informed choice and discernment. The availability of health resources provides the opportunity for the consumer to access information on a variety of topics. The result is that the patient is no longer passive and a lay person, with the doctor as the expert (Kuhlthau 1991; Lupton 1997; Prior 2003). Potentially, the consumer may become an expert in various health topics, thus challenging the paternalism of conventional medicine and the information role of the doctor. The increased availability of information on the Web, particularly of health information, has contributed to the relevance of this study. The information professional can contribute to a more informed society in which individuals are health-conscious and aware of the relationship between lifestyle choice and the burden of chronic disease. The impact of individuals taking personal responsibility can have a global influence on the epidemic of chronic disease.

1.5.4 Sociological relevance

The burden of chronic disease is a matter of individual choice, as well as global concern. In an address to the World Health Assembly, Gro Harlem Brundtland of World Health Organisation (WHO) warned that "the world is living dangerously, either because it has little choice or because it is making the wrong choices about consumption and activity" (WHO 2002a:3). Health is a societal, economic and political responsibility. Interest and involvement in HP among many sectors including governmental bodies, corporate bodies, universities, health practitioners, wellness programmes and consumers or lay people is increasing and will be discussed in section 2.2.3. Zwillich (2003) remarks on previous comments by Surgeon General Richard Carmona about his intention to get Americans to make healthy choices that can help prevent disease, as poor health choices and a lack of personal responsibility are

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overburdening the United States (U.S.) health system with high costs. Choice requires information. Information has the ability to empower. Information is required for people to make choices and more importantly, to make informed choices about their health, wellness and lifestyle. Coiera (2004:1197) suggests that the reinvention of the health care system should consider that technical systems have social consequences and that social systems have technical consequences. In order to design socio-technical systems, there should be an understanding of how people and technologies interact. This study is focused on the design of a database-driven web site to make health information resources within the WELLNESS approach accessible. It is both the responsibility of the individual to make personal, informed, rational choices about their lifestyle and health, and of the information professional to make WELLNESS health information resources accessible.

1.5.5 Psychological relevance

The relevance of this study lies in the fact that it brings together information on the user as health information seeker in order to support his/her quest for optimal health, that is wellness. WELLNESS connotes a worldview in which health is important for personal sense-making, is wholistic and reflects the thinking of the health information seeker within the new paradigm. This study intends to contribute to a sense of empowerment and personal fulfillment. This includes being at peace emotionally and psychologically, the ability to choose and be in control of one's health by making personal, informed and responsible lifestyle choices. The intention of the prototype database-driven web site is to offer principles and ideals for discourse and guidance for well-being. The perspective of health is that the various spheres of life are interconnected (Craig 2005b:5; Korp 2006:79; Sointu 2006:345). This study will contribute to the body of knowledge (Bates 1989; Bush 1945; Cline & Haynes 2001; Cothey 2002; Crespo 2004; Forkner-Dunn 2003; Fox 2006; Hirji 2004; Laing, Hogg & Winkelman 2004; McClean & Shaw 2005; McFedries 2002; Motive Resources 2004; Nicholas *et al* 2003; Norman 1993; Poensgen 2001; Powell & Clarke 2002; Preece, Rogers & Sharp 2002; Rogers & Mead 2004) about the user as health information seeker by profiling

the user in a specific user group, namely the WELLNESS health information seeker.

The epidemiological, philosophical, epistemological, sociological and psychological perspectives of this study are intended to contribute to the body of knowledge about the user, the resources and the tool in the context of health information-seeking for the purpose of achieving wellness. The relevance of the study identifies the purpose of the study.

1.6 PURPOSE OF THE STUDY

The recommendations and proposed areas of further research made in the researcher's (Steyn 1999) original study, outlined in Annexure one, were evaluated to determine the purpose of this study. The purpose of this study is *The development of a reference database of health information resources to facilitate informed lifestyle choice.*

Specific objectives of this study to achieve this purpose are:

- analyse the current health care situation and the emergence of a new worldview
- analyse the impact and implications of the use of the Web for health information
- identify the profile of the WELLNESS health information seeker
- establish a model of selection criteria for WELLNESS health information resource selection and content selection criteria within the framework to ensure quality
- develop a model for thesaurus construction
- construct a WELLNESS thesaurus
- identify criteria for database host choice
- assess whether database host will accommodate conceptual schema
- identify aspects of web site design process
- design prototype web site

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- choose heuristic instrument for usability evaluation.

To be systematic, as objective as possible and thorough in this study, a plan should be detailed and followed to achieve the purpose and specific objectives stated above.

1.7 RESEARCH METHODOLOGY

A major focus of this study is that of design. It is therefore essential that suitable research methods are identified and understood in terms of the capabilities of these methods so that the most appropriate ones can be matched to the research problems, specific objectives (section 1.6) and to the relevant research and theories.

It is important to discuss the research methodology of this study in relation to the research methodology of the original study (Steyn 1999) as set out in Annexure one. The research matrix in Table 1.1 reflects the research methods used previously, as well as the research plan to be used in this study. It is important to note that a combination of qualitative and quantitative research methods, namely interviews, questionnaires, a survey and focus group were used to collect data that was analysed to identify user needs, user requirements, user information behaviour, user profile, selection criteria, entity types, subject vocabulary control, user friendliness and user interface (annexure 1). The findings (annexure 1) will serve as background information to this study. This study is a continuation of the original study.

Table 1.1 Research matrix

Objectives	Literature analysis	Qualitative research	Quantitative research	User study	Focus group	Model and extended model of database design	Selection criteria model	Model of thesaurus construction	Heuristic evaluation instrument	Prototype WELLNESS web site
Steyn 1999										
Analyse the current situation in health care (South Africa)	X									
Identify information infrastructure and types of sources to be used	X	X interview		X	X					
Identify users and potential users	X	X interview	X questionnaire	X	X					
Analysis of users requirements	X	X	X	X	X					
Design of conceptual schema	X					X				
Cottrell 2007										
Analyse the current health care situation & emergence of a new worldview	X									X
Analyse the impact and implications of the use of the Web for health information	X									X
Identify the profile of the WELLNESS health information seeker	X							X	X	X
Establish a model of selection criteria for WELLNESS health information resource selection and content selection criteria	X	X interview					X	X		X
Develop a model for thesaurus construction	X							X		X
Construct a WELLNESS thesaurus	X	X interview				X		X		X
Identify criteria for database host choice	X	X interview				X				X
Assess whether database host will accommodate conceptual schema	X	X interview							X	X
Identify aspects of web site design process	X								X	X
Design prototype web site	X								X	X
Choose heuristic instrument for usability evaluation	X								X	X

The emphasis in this study is on an extensive analysis of reported literature to update the information reported on in the original study (Steyn 1999). Applied research is another research method used. In applied research, the emphasis is on providing information to be used pragmatically, of taking theory and concepts and applying these to real world phenomena in order to make a contribution to the profession, which in this case is information science, in particular CHI (Powell & Connaway 2004:54). This requires that the problem is defined, the literature is analysed and information is applied in order to solve problems and improve practice.

Research is an activity that contributes to understanding phenomena or the set of behaviours of some entities. These phenomena may be created rather than occurring naturally. Methods are used to produce understanding and knowledge. Qualitative research accommodates emergent design as it is iterative, flexible and inherently exploratory. However it was established that an emerging research method, design research, is particularly applicable to information systems, computer science and certain professions such as architecture, aeronautical engineering and education (Simon 1996; March & Smith 1995; Vaishnavi & Kuechler 2007). This research method supports the design and development of a prototype database-driven web site. Design connotes an activity of creating something; it clarifies the process involved and results in an artifact, something that is artificial or man-made that meets certain goals. Design is the know-how for implementing an artifact that meets a set of functional requirements.

The application of the methods and concepts of design research are discussed in section 1.7.3.

1.7.1 Literature analysis

It is important to analyse the reported literature to clarify the concepts to be used and to provide a solid basis of theory and current research by which the practical applications can be evaluated. An analysis of the literature will focus on the objectives which include:

- analysing the current health care situation and the emergence of a new worldview

- analysing the impact and implications of the use of the Web for health information

- identifying the profile of the WELLNESS health information seeker

- establishing a model of selection criteria for WELLNESS health information resource selection and content selection criteria within the framework to ensure quality

- developing a model for thesaurus construction

- constructing a WELLNESS thesaurus

- identifying criteria for database host choice

- assessing whether database host will accommodate conceptual schema

- identifying aspects of web site design process

- designing prototype web site

- choosing an heuristic instrument for usability evaluation.

Each chapter will be grounded in an extensive literature analysis.

1.7.2 Focus group

Health professionals reflecting the WELLNESS approach provided expertise, shared experience and enhanced scientific credibility in the original study. They will be consulted in this study concerning the identification of selection criteria to be used in the choice of resources for inclusion or exclusion in the database. The expertise of the systems administrators of potential hosts, as well as of the information professional, should be shared in discussions related to the functioning of the database in the Web environment. A focus group of at least five individuals will be consulted at various stages of the design of the prototype web site. The data dictionary, Entity-Relationship (E-R) model, thesaurus, selection criteria and user profile are all key elements in this process. The focus group method will be used in Chapter five for the

construction of the thesaurus and in Chapter seven for evaluating the storyboard and wireframes of the prototype web site.

1.7.3 Adoption and adaptation of models and instruments

ICT artifacts are designed to improve processes. There are four outputs of design research, namely constructs, models, methods and instantiations (March & Smith 1995):

- constructs - the conceptual vocabulary of the problem and solution that emerge during the conceptual phase and are continuously refined during the design process. An artifact consists of many entities and their respective relationships
- models - a model proposes how things are and presents what something does showing relationships
- methods - the set of steps necessary to perform a task so that goals are met in solving the identified problem and accomplishing the end result
- instantiation - the operationalisation of the constructs, models and methods in an artifact. It is possible that this may precede the stage of complete realisation of the conceptual vocabulary and models in an actual artifact.

The design researcher pragmatically becomes aware of what information means through the process of construction as the constructed artifact's behaviour is the result of interaction of the components. The process of design is iterative and the designer as the observer simultaneously understands the phenomenon and the design of the artifact. Knowing is making (Vaishnavi & Kuechler 2007).

The methodology of design research (Vaishnavi & Kuechler 2007) includes the following:

- awareness of problem - interest stimulated by various sources, or literature analysis, resulting in a proposal for research
- suggestion - proposing a prototype in a new configuration of existing and/or new elements
- development - implementation of the tentative design which may or may not include construction of the artifact
- evaluation - criteria are implicit and explicit in the proposal so that any deviations from expectations require an explanation
- conclusion - the final phase of the research effort. The knowledge gained and the subject for further research is reported.

The research matrix revealed that the research methods to be used to construct the thesaurus, model of selection criteria, prototype database-driven web site and heuristic instrument will be an analysis of reported literature to identify possible models and instruments to be adopted or adapted to inform the process of design (Aitchison, Gilchrist & Bawden 2000; Broughton 2006; Morville 2003; Preece, Rogers & Sharp 2002). The four outputs suggested by March and Smith (1995) are important considerations as constructs, models and methods will be researched, selected, and adopted and adapted towards instantiation. The methodology described above will guide the research and design process.

The field of study for this research project must be specified and therefore delimited.

1.8 DELIMITATION OF THE FIELD OF STUDY

As discussed in section 1.2, the shift from the implementation of the extended model of the original study (Steyn 1999) to the new model which outlines the phases of the development of the database-driven web site delimits the study. Within the new model it was not possible to complete the development and implementation process required for a fully-functional database-driven web site until the following aspects of design were addressed:

- change from a software-based to a database-driven web site requiring identification of criteria for selection of a database host
- assessment of conceptual schema to determine appropriateness of database host
- identification of aspects of design of a web site
- design of web site prototype

The study will be delimited to the user, resources and tool in the context of the design of the database-driven web site. The change in technology and the need for a database host and a web site has made it necessary to revise the development process to concentrate on the aspects of the design phase. The development phase is beyond the scope of this study because of manpower, financial support and time limitations. Dependence on a database host requires that modifications to the conceptual schema, as well as revisions and modifications of the database host to accommodate the WELLNESS thesaurus and the prototype web site, should be made in collaboration. The implementation phase will consist of the host programmer working together with the web developer and the researcher, as information professional, resulting in a fully-functional database-driven web site. These phases of the development of the reference database of health information resources to facilitate informed lifestyle choice require further research and will be discussed in Chapter eight.

The research project will be delimited to the design phase of a prototype database-driven web site of WELLNESS health information resources. Other aspects to be considered in delimitation of the field of study include:

1.8.1   The WELLNESS health information seeker

The health information seeker will be specified according to their health information-seeking behaviour with an emphasis on the WELLNESS approach to make informed personal lifestyle choices.

1.8.2 Reference database

A reference database will be made available to meet the information need of the WELLNESS health information seeker requiring appropriate WELLNESS resources to make informed lifestyle choices. This type of database has been chosen because of the many problematic factors such as ownership, copyright, financial implications, volume and technology requirements associated with a source database. The Web has made it possible to reference different types of resources and provide links to many sources of wellness information, some of which have full-text content. This has expanded the concept of reference database.

1.8.3 Prototype database-driven web site

A low-fidelity prototype web site will be designed. It will be a database-driven web site with the conceptual schema assessed in light of the potential mapping to the database host, rather than the development and implementation of a fully-functional database-driven web site. Microsoft PowerPoint will be used to develop the low-fidelity prototype. Comparatively, a high-fidelity and a low-fidelity prototype highlight similar issues and will be discussed in section 7.3. It is not necessary to develop the prototype in a web application (e.g. Microsoft FrontPage) linked to a small test database. Time and resources will not accommodate the development phase, as outlined in section 1.2. This is the perspective of both the Directors of Operations and Technology of Curriculum and Instruction Resource Center Linking Educators (CIRCLE) and the researcher (chapter 8). This will be the focus of the development phase as recommended in Chapter eight.

1.8.4 Selected resources

The focus of this study is WELLNESS. A model of selection criteria will be developed to identify suitable resources for inclusion, as well as to exclude those that are irrelevant according to the WELLNESS approach. The thesaurus provides vocabulary control for these selected resources, as well

as guidelines for indexing and retrieval. Resources to be included reflect the eight components of WELLNESS, namely the use of water, exercise, life in proper balance, loving and supportive relationships, nutrition of a good quality and appropriate quantity, enjoying adequate rest and relaxation, sunlight and fresh air and stress management.

1.8.5 Use of conceptual schema

A conceptual schema, consisting of an E-R diagram and data dictionary, was developed in the original study (Steyn 1999).   The E-R diagram and data dictionary are set out in Annexure one. The conceptual schema will be used, in this study, in the choice and assessment of a database host.

Delimitation of the field of study highlights the key concepts that require definition.

1.9 DEFINITION OF KEY CONCEPTS

To define suggests that there are differences between concepts and that the essential meaning be clarified. The major concepts as reflected in or associated with the title of this study, namely *the development of a reference database of health information resources to facilitate informed lifestyle choice* will be defined. These concepts include development, reference database, Internet, Web, database-driven web site, resources, thesaurus, health promotion, wellness, WELLNESS, conventional medicine, CAM, CHI, informed lifestyle choice and user.

1.9.1 Development

The *Reader's Digest Oxford Complete Wordfinder* (1993 s.v. 'development') defines development as: "the act or an instance of developing; the process of being developed; a stage of growth or advancement". In the context of this study, development refers to the process of development of the design of a database-driven web site. Database-driven web site design connotes

research and use of design factors in web site design, mapping of conceptual schema on a database host and prototyping. There are a number of aspects of this study in relation to the user, the resources and the tool that require development:

- the WELLNESS health information seeker profile
- the five-dimensional model of selection criteria
- a set of criteria for content selection within the model
- a model for the construction of the thesaurus
- the database design
- the web site design
- the prototype database-driven WELLNESS web site.

1.9.2   Reference database

The following definition by the researcher (Steyn 1999:15) of a database will guide this study:

> A database may be defined as a store of interrelated data representing some aspect of the real world, designed for a specific purpose and/or on a particular subject. The database consists, of entities, their attributes and the relationships amongst entities which are to be described consistently (i.e. relational approach). The database is designed to logically organise data or information to simplify retrieval and maintenance. A database can be manual or computerised. If computerised the facilities of computer hardware and software are used to enhance the retrieval and storage of information in the database. A database may be classified as belonging to one of two types, namely reference or source database.

A reference database refers or points the user to the original, actual sources of information, includes a wide range of formats, is multidisciplinary or more focused in subject coverage, is a bibliographic tool used to collect entities and information about entities (metadata) in a computerised system for retrieval to solve user problems. For the purpose of this study, the reference database will be referred to as the conceptual schema which will be mapped to the

database host, CIRCLE, and will comprise WELLNESS health information resources.

1.9.3   Internet

In this study, the Internet will be defined as: a networking infrastructure; a world-wide, publicly accessible electronic communications network of interconnected networks via which the World Wide Web (WWW) is accessed and on which the WWW is based; not interchangeable or synonymous with the term WWW.

1.9.4   Web

The WWW, referred to as Web in this study and as information highway (Behrens 2000:8), may be defined as:

- all the services, sources and ICTs that facilitate linking of computers to gain access to information in electronic form
- a system of interlinked, hypertext documents accessed via the Internet
- a way of accessing information over the medium of the Internet
- the user part of the Internet
- an information sharing model built on top of the Internet
- a way in which information can be disseminated over the Internet
- designed to allow easier navigation through the use of graphical user interfaces and hypertext links between different addresses
- based on transmission control protocol/Internet protocol (TCP/IP) protocol technology to swap information back and forth
- used for purposes of communication, access to information, for business and for recreation
- consisting of Web pages viewed with a Web browser.

1.9.5   Database-driven web site

For the purpose of this study a web site will be defined as:

- forming part of the Web
- a group of Web pages containing hyperlinks to each other
- organised under a particular domain name or uniform resource locator (URL)
- a collection or group of electronic pages with a homepage which is the first page seen by users entering the site
- made available online by an individual, company, educational institution, government or organisation
- containing text, graphics, multimedia elements and other programming elements
- dynamic - can change every time pages are loaded or change its content based on what the user does.

The term database-driven web site will be defined as:

> a web site that organises a vast amount of data and allows information to be retrieved on demand…A database-driven web site is written in a programming language that refreshes it dynamically when data fields in a database are updated (Netlingo 2007).

1.9.6   Resources

The researcher established that the concepts 'source' and 'resource' are not clearly defined and are used loosely and interchangeably.   According to Behrens (2000), an information source is any type of object that provides information.   An information source is a source of information.   Libraries contain, control, organise and make accessible sources of information.   A source may have different forms or modes in which it exists as a physical entity.   The form of the information source determines access, for example, read or listen. A collection of information sources is referred to as a resource.

Resource sharing is how sources and resources are made accessible through bibliographic control.

For the purpose of this study, 'source' will be defined as an entity represented in a variety of formats (i.e. media types) having attributes and providing health information (section 6.4, figure 6.1). The sources will be organised according to their relationships to be a 'resource' of health information. Other collections of sources of health information, for example web sites with health information on cancer and diabetes, are potential resources of health information. Resource sharing is facilitated by the Web through links to other organized collections of sources and resources of information. The content of the WELLNESS web site consists of sources and resources. It functions as a resource that can provide health information. In this study, this information is specifically WELLNESS information.

1.9.7 Thesaurus

The thesaurus will be defined as: a semantic network of concepts, connecting words to their synonyms, homonyms, antonyms, broader and narrower terms and related terms; a controlled vocabulary going from many words to one word; and part of the online database tightly integrated with the user interface of the WELLNESS web site to improve navigation and retrieval.

1.9.8 Health promotion

The definition of heath promotion used in this study is a composite of definitions and descriptions as researched in the literature (Breslow 2000:40; Jamner 2000; Merrill, Friedrichs & Larsen 2002; O'Donnell 1986:4; O'Donnell 1989; Schuster *et al* 2004a:350; Sointu 2006; UK Department of Health 2008; WHO 2002b; WHO 2003a; WHO 2005a; Yach 2002; Ziglio 2000). Health promotion will be defined as the science, art and provision of health information to support rational choices about the prevention of disease, the individual's ability to function and perform daily activities, lifestyle change and promotion of health towards a state of optimal health. Optimal health is the

balance of physical, emotional, social, spiritual and intellectual health with emphasis placed on themes of well-being and quality of life.

1.9.9 Wellness

For the purpose of this study, wellness is defined as a worldview that values a way of life that contemplates life in the context of health. It is a process of taking steps to prevent disease and promote health by making rational choices about lifestyle and the way one lives life. Wellness assumes a wholistic and balanced view of all the dimensions of being a human being, namely the physical, emotional, spiritual and mental dimensions. In order to make choices and decisions, information about different options, alternatives, health and medical systems and practices is required.

1.9.10 WELLNESS

The acronym WELLNESS will be used in this study to connote a specific approach to wellness that is achieved when the following eight components are integral to lifestyle; water, exercise, life in proper balance, loving and supportive relationships, nutrition of a good quality, appropriate quantity, enjoying rest and relaxation, sunlight and fresh air and stress management. The acronym will be used to describe the WELLNESS health information seeker, WELLNESS framework, WELLNESS approach, WELLNESS selection criteria, WELLNESS heath information sources and resources, WELLNESS thesaurus and the database-driven WELLNESS web site.

1.9.11 Informed lifestyle choice

Informed lifestyle choice assumes a need by a WELLNESS health information seeker for WELLNESS health information to make informed lifestyle choices to take personal responsibility for maintaining optimal health and achieving wellness.

1.9.12 Conventional medicine

The preferred term used in this study is conventional medicine. This refers to the practice of medicine by holders of medical degrees and by allied health professionals such as physical therapists, psychologists, nurses etcetera. Conventional assumes that this approach is credible, accepted, established, approved, sanctioned, authoritative and scientific, and provides the practice with power as it is considered to be the benchmark or standard by which other approaches are evaluated and their existence questioned and even negated. Its practice includes the use of drugs, surgery, other symptom-relieving agents and treatments that deal with disease. Health is viewed as the absence of disease. Other terms that are used are western, biomedical, orthodox and allopathic medicine (MacIntosh 1999).

1.9.13 Complementary and alternative medicine

CAM refers to a group of diverse medical and health care systems, practices and products that are not presently considered to be part of conventional medicine. The National Center for Complementary and Alternative Medicine (NCCAM) (2006) definition of CAM is:

> a broad domain of healing resources that encompasses all health systems, modalities, and practices and their accompanying theories and beliefs, other than those intrinsic to the politically dominant health system of a particular society or culture in a given historical period.

Complementary medicine refers to a system that is used in conjunction with conventional medicine. Alternative medicine connotes that there are practices that are distinct from and considered alternative to the conventional approach. In this context, other terms used for CAM include unconventional, non-conventional, unproven and irregular medicine or health care. CAM will be used as the preferred term that incorporates the health and medical systems and practices that are not conventional medicine.

1.9.14 Consumer health informatics

CHI is the branch of medical and health informatics that analyses consumers' needs for information; studies and implements methods of making information accessible to consumers; and models and integrates consumers' preferences into medical information systems. In this study, the following working definition of the American Medical Informatics Association (AMIA) (2007) for CHI will be used:

> a subspecialty of medical informatics which studies from a patient/consumer perspective the use of electronic information and communication to improve medical outcomes and the health care decision-making process.

1.9.15 User

For the purpose of clarification, the term user will be used in a generic and specific sense to understand information behaviour. In the generic sense, the user is an individual with distinctive characteristics, search behaviour and search processes that when understood contribute to an understanding of the user in a more specific sense, namely as health information seeker, and as a specific user group, namely WELLNESS health information seeker. In the context of the design of the database-driven web site, the term user refers to the specific group for whom the design is being undertaken. The purpose is to focus the design to ensure it is user-centred and that it will meet the criteria of usability.

In this study, the term user is used in relation to various contexts of the user in relation to information, information needs and requirements. As patient, the user is passive and largely dependent on the health care practitioner for information. The user as consumer and reflexive consumer connotes that the user is an active user of health information, is empowered, motivated and health conscious. The search for information about a healthy lifestyle is related to personal behaviour (Dutta-Bergman 2004c; Hyman 2005). Reflexive consumer identifies the user as the "self who acts in a calculated

way to engage in self-improvement and who is skeptical about expert knowledge", but who requires and needs health information (Lupton 1997:373). Maxwell (1998:xvii) calls those who thirst for health information - health seekers. The term health information seeker refers to the user who seeks health information. The WELLNESS health information seeker is the specific user group interested in lifestyle factors of wellness.

The three major aspects of this study are the user, the resources and the tool. A synopsis of chapters will reveal the plan of study.

1.10   SYNOPSIS OF CHAPTERS

This study investigates the interrelationship of the user, resources and tool. In Table 1.2, each chapter focuses on these relationships and the use of capital letters illustrates the prime focus.

Table 1.2 Synopsis of chapters

CHAPTER/TITLE	FOCUS	CONTENT

Two – Health care: emergence of a new world view	• USER
	• RESOURCES
	• TOOL
		• Current health care situation
		  o Burden of chronic disease
		  o Limitations of conventional medicine and increasing interest in CAM
		  o HP and disease prevention
		  o Wellness and informed personal lifestyle choice
		• Health informatics
		  o CHI

Three – The user profile	• USER	• User information need
		  o Information need of health information seeker
		• User search behaviour
		  o Search processes
		  o Nature of Web search and retrieval capabilities
		  o User interface
		• Characteristics of health information seeker
		• WELLNESS health information seeker profile

Four – WELLNESS health information resources: criteria for selection	• RESOURCES	• Framework for collection of WELLNESS resources • Development of a model for selection criteria

CHAPTER/TITLE	FOCUS	CONTENT
		• Content selection criteria
Five – WELLNESS thesaurus construction	• TOOL • User • Resources	• Choice of thesaurus as indexing tool • Description of thesaurus • Functions of thesaurus • Identification of a model for construction • Process of construction • Identification of relevant thesauri • Structure and format of WELLNESS thesaurus
Six – Database design	• TOOL • User • Resources	• Software- to web-based database • Choice of database host • Assessment of conceptual schema

Seven – Web site design	• TOOL
	• USER
	• RESOURCES
		• Design of the prototype WELLNESS web site
		   o User needs and requirements
		   o Evaluation of existing health web sites
		   o Conceptual model
		   o Criteria for an appropriate WELLNESS web site
		• Prototyping the WELLNESS web site
		• WELLNESS web site evaluation

Eight – Conclusion and recommendations		• Problem in its context • Methodology • Findings • Recommendations for further study • Proposed areas for further research

1.11 CONCLUSION

This chapter provided the general orientation for the research and the formulation of the problem statement to guide the researcher in the study of the user, the resources and the tool. Chapter two will highlight and discuss the emergence of a new worldview in health care. The burden of chronic disease, the limitations of conventional medicine and increasing interest in CAM, HP and disease prevention, wellness and informed personal lifestyle choice will be the focus of the current health care situation. Health informatics, especially CHI as a multidisciplinary response to the use of the Web in health care by a variety of groups, will highlight the relevance of this research.

CHAPTER TWO

HEALTH CARE: EMERGENCE OF A NEW WORLDVIEW

2.1 INTRODUCTION

The purpose of this chapter is to report on an analysis of the literature relevant to the emergence of a new worldview in health care. In order to establish the profile of the WELLNESS health information seeker (chapter 3) and develop the database-driven web site (chapters 6 & 7), the need for access to health information requires contextualisation. The new worldview is characterised by the broadening of the base of conventional medicine to integrate other systems, practices and worldviews such as CAM, HP, disease prevention and wellness that emphasise the need to take personal responsibility for one's health. Risk factors (Beeson *et al* 1989; Buettner 2005; Craig 2005b; Fraser 2003; Fuhrman 2003; Mathers & Loncar 2006; Ornish 1990; Shine 2001; WHO 2002b, 2003b&c) correlated with the growing epidemic of chronic disease and personal lifestyle choices must be considered.   This has impacted the user of health information who is encouraged to become an active participant in his/her health and well-being. Research (Bansil *et al* 2006; Cline & Haynes 2001; Eysenbach & Kohler 2002; Forkner-Dunn 2003; Fox 2006; Fox & Rainie 2003; Laing, Hogg & Winkelman 2004; Powell & Clarke 2002) has shown that the Web is increasingly being used as a response to this trend by governments, organisations, corporations, the pharmaceutical industry, institutes, the medical fraternity, libraries, hospitals and individuals for their personal health. Health informatics, specifically CHI, has evolved from a multidisciplinary response to the interests of all of the groups mentioned above who are using the Web for health information. Informed personal lifestyle choices require access to quality, credible and relevant health information.

A discussion of the new worldview includes a description of the burden of chronic disease, the limitations of conventional medicine and increasing

interest in CAM, HP and disease prevention, and wellness and informed personal lifestyle choice within the current health care situation. Health informatics, specifically CHI, is a multidisciplinary response to the need for health information within this current health care situation.

An explanation of the current health care situation with reference to the old and new paradigm is needed to form a framework for a discussion of the issues related to chronic disease, conventional medicine, CAM, HP and disease prevention, and wellness.

2.2 CURRENT HEALTH CARE SITUATION

The old paradigm was characterised by the dominance of conventional medicine with its emphasis on disease, diagnosis, dysfunction of bodily mechanisms, treatment of symptoms rather than prevention, the lack of personalisation and a patronising view of the patient (Eysenbach 2001; Hess 2004; Hyman 2004b; Sointu 2006). The burden of responsibility for one's health as a patient was generally attributed to the practitioner rather than accepting personal responsibility.

During the past several decades, there has been a significant shift in the worldviews of health, resulting in a new paradigm of science and medicine. Patients have become disillusioned with the old paradigm. The concept of health as merely a lack of illness has broadened to include the ideas of psycho-physical well-being and wellness (Breslow 2000; Craig 2005b; *Definition of wellness* 2003; Jamner 2000; Nedley 1998; Schuster *et al* 2004a; Sointu 2006; WHO 2005a). There has been a significant increase in searches for HP, wellness and self-help information which has become more readily available and accessible by the emergence of the Web. These are important factors that have contributed to a shift in paradigm, as well as responsibility (Anderson 2004; Dutta-Bergman 2005; Forkner-Dunn 2003; Fox & Rainie 2003; Maxwell 1998; Princeton Survey Research Associates 2000 & 2001; Tyson 2000; Williams 2003). The notion of patient has shifted towards the

concept of health consumer seeking health information (Anderson 2004; Dutta-Bergman 2005; Hogle 2002; *Mosby's* 2002; FDA 2003).

The major factors contributing to this shift that were researched and are discussed include:

- the burden of chronic disease
- limitations of conventional medicine and increasing interest in CAM
- emphasis on HP and disease prevention
- wellness and informed personal lifestyle choice.

It is important to note the role of personal choice, both in a lifestyle perspective and its relationship to chronic disease. Chronic disease is known to be caused by a small number of known and preventable risk factors, that is tobacco use, physical inactivity and unhealthy diet (WHO 2005c). The following discussion demonstrates the importance of lifestyle choices and the need for information.

2.2.1 Burden of chronic disease

Chronic diseases include cardiovascular disease (heart and stroke), cancer and diabetes (MedicineNet 2004 s.v. 'chronic disease'; NCCDPHP 2007; WHO 2005a). They are the most common and costly health problems, but are also among the most preventable. Chronic disease is a leading cause of death and has been recognised as a growing worldwide epidemic with economic and social implications (Shine 2001; WHO 2005c). Beaglehole, WHO (2005b) Director, Chronic Diseases and Health Promotion, states that:

> the real tragedy is that more hasn't been done to avoid this epidemic, as overweight and obesity, and their related chronic diseases, are largely preventable. Approximately 80% of heart disease, stroke, and type 2 diabetes, and 40% of cancer could be avoided through healthy diet, regular physical activity and avoidance of tobacco use…low-cost, simple approaches are the key to saving 36 million lives by 2015.

Figure 2.1 shows the projected main causes of death worldwide for 2005, as reported by WHO (2005c).
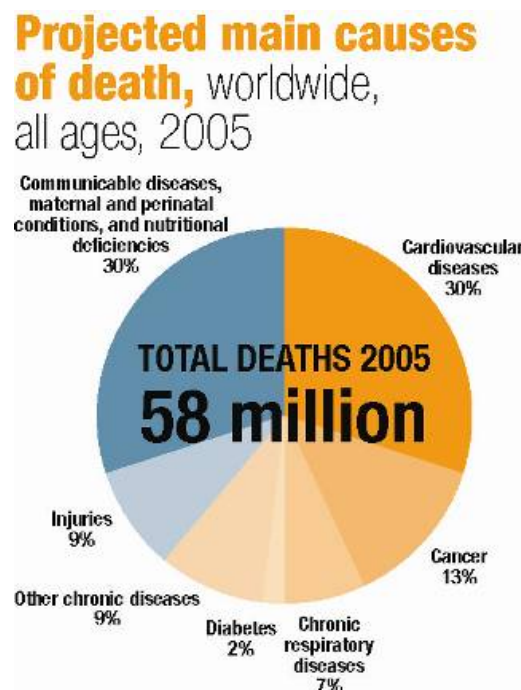
Figure 2.1 Projected main causes of death 2005

Calculations indicate that in 2005 approximately 60% of the 58 million total reported deaths in the world were attributable to chronic diseases (WHO 2005a). The percentage of death due to chronic disease in 2005 and the projected percentage for 2015 as compared to all deaths (WHO 2005a) are shown in Figure 2.2.
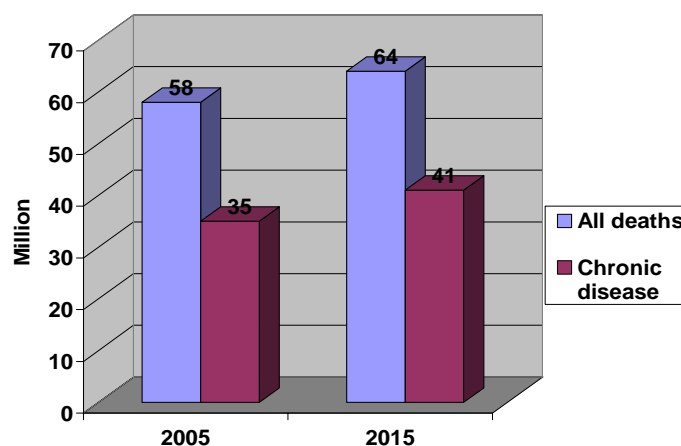
Figure 2.2 Comparison of chronic disease deaths and all deaths

The WHO (2005a) projection for 2015 indicates that:

- 17 million people will die from communicable diseases, maternal and perinatal conditions, and nutritional deficiencies combined
- 41 million people will die from chronic diseases
- cardiovascular diseases will remain the single leading cause of death, with an estimated 20 million people dying, mainly from heart disease and stroke
- deaths from chronic diseases will increase by 17% between 2005 and 2015, from 35 million to 41 million.

Between 2005 and 2015, an estimated 388 million people worldwide will die of chronic disease. The major risk factors together account for around 80% of deaths from heart disease and stroke. Each year at least:

- 7.1 million people die as a result of raised blood pressure
- 4.9 million people die as a result of tobacco use
- 4.4 million people die as a result of raised total cholesterol levels
- 2.7 million people die as a result of low fruit and vegetable consumption
- 2.6 million people die as a result of being overweight or obese
- 1.9 million people die as a result of physical inactivity (WHO 2005a).

The relationship between risk factors, lifestyle choices and the burden of chronic disease is evidenced in the consequences of tobacco use, physical inactivity and unhealthy diet which contribute to the incidence of obesity and diabetes. Tobacco death projections (Mathers & Loncar 2006) are shown in Table 2.1.

Table 2.1 Tobacco death projections

Year	Deaths (millions)
2005	5.4
2015	6.4
2030	8.3

Tobacco usage is projected to kill 50% more people than HIV/Aids and will be responsible for 10% of all deaths globally in 2015 (Mathers & Loncar 2006). Although smoking has received a lot of public attention, obesity is a significant predictor of chronic diseases, chronic ailments and quality of life.

The term 'globesity' refers to the global incidence of overweight and obesity (WHO n.d). Worldwide one billion adults are overweight with over 300 million of these obese (Rigby & James 2003:20). Obesity is a major contributor to chronic disease, specifically Type 2 diabetes. In the European Union (EU) 279,000 deaths were attributed to excess weight in 2003 (Banegas *et al* 2003). In South Africa, 29% of men are overweight and 9% are obese, while 56% of women are overweight and 29% are obese (Goedecke, Jennings & Lambert 2006). Fuhrman (2003:x) observes that, according to the U.S. Surgeon General 300,000 deaths are caused by or related to obesity annually. Children are now at risk for obesity and Type 2 diabetes, giving rise to a syndrome named 'diabesity' (Evans 2003:106).

According to the International Diabetes Federation (IDF) (2007), the number of people diagnosed with diabetes has increased from 30 million to 246 million over the past two decades. Figure 2.3 illustrates the number of people with diabetes in 2007 and the projections for 2025, according to world regions: AFR – Africa, EMME – Eastern Mediterranean and Middle East, Eur – Europe, NA – North America, SACA – South and Central America, SEA – South-East Asia, WP – Western Pacific (Diabetes Atlas 2006).
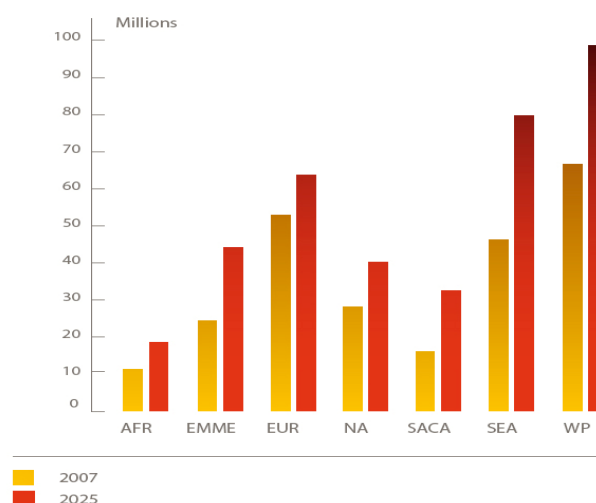
Figure 2.3 Number of people with diabetes by region, 2007 and 2025

Chronic disease was originally attributed to a Western lifestyle. However, globalisation and urbanisation have contributed to the increase in the adoption of a Western lifestyle in developing countries. Developing countries are increasingly suffering from high levels of chronic diseases thus challenging the view that chronic diseases are diseases of affluence (Ezzati *et al* 2005). A contributing factor is the adoption of Western lifestyles and lifestyle choices and habits. This infers that often disease is a choice and many of these chronic diseases are largely preventable (Shine 2001:s150).

Making health and lifestyle changes is considered to be the most cost-effective, affordable and sustainable course of action to cope with the chronic disease burden. These are factors that people, either individually or as a society can control. Not only is health a personal issue, but it has also resulted in the need for transformation in the political, economic and social arenas to bring about important changes in both the conception, as well as the organisation of health and social care (Maxwell 1998:9; Strong *et al* 2006; Watson & Platt 2000:1).

The risk factors, as discussed above, predict the diseases of tomorrow according to Ruth Bonita, WHO Director of Surveillance (WHO 2003c). According to National Center for Chronic Disease Prevention and Health Promotion (NCCDPHP) (2007), adopting healthy behaviours, such as eating nutritious foods, being physically active and avoiding tobacco use, can prevent or control the devastating effects of these diseases. As discussed in section 2.2.3, HP and disease prevention initiatives should therefore consider these risk factors as critical in lifestyle and lifestyle choice with reference to health and healing. Making information available about these risk factors to enable personal decision-making is the goal of this study.

The statistics and charts highlight the burden of chronic disease and the worldwide epidemic. The extent of the problem and the impact that this study can make, by providing access to health information to lessen the burden of chronic disease, is significant. The research identified that there is a relationship between lifestyle and chronic disease. The risk factors are

related to lifestyle choices. Therefore information emphasising the importance of making personal informed choices about how one lives one's life should be made available. The shift from the old paradigm, that of the dominance of conventional medicine, to the new paradigm, in which both complementary and alternative approaches to health facilitate personal responsibility for making lifestyle choices, required investigation.

2.2.2 Limitations of conventional medicine and increasing interest in CAM

An analysis of the literature resulted in a comparison in Table 2.2 of the main elements of conventional medicine and CAM which evidenced an evolving paradigm shift (Barlett & Steele 2004; Barrett *et al* 2003; Carter 1993; Dossey 2004; Gordon 2004; Hess 2004; Hirschkorn 2006; Hyman 2004b; Hyman 2005; Milan *et al* 1998; Ornish 1990; Schuster *et al* 2004a; Sointu 2006; Werbach 2004). The analysis relied on existing generalisations and stereotypes to highlight the differences between the approaches.

Table 2.2 Conventional medicine and CAM

Elements	Conventional medicine	CAM
Definition	- The scientific study of diagnosing, treating of disease - Having a theoretical basis - Used by holders of medical degrees	"Is a broad domain of healing resources that encompasses all health systems, modalities, and practices and their accompanying theories and beliefs, other than those intrinsic to the politically dominant health system of a particular society or culture in a given historical period" (Zollman & Vickers 1999)
Synonyms	- Allopathic medicine - Orthodox medicine - Biomedical - Sometimes referred to as 'traditional' medicine	- Complementary medicine - Alternative medicine - Unconventional medicine - Non-conventional medicine - Irregular medicine or health care
Presuppositions	The approach is - accepted - established - approved - sanctioned - authoritative and the benchmark by which all other approaches are evaluated, their existence questioned and even negated - scientific	- Health is more than an absence of disease or physiological health - Health is holistic, a sense of general well-being, making sense of difficult situations - Taking personal responsibility - Lifestyle and the importance of choice - Health and fitness are important values. - Specific activities are perceived to have a restorative effect on mind and body of the person - Appreciation of wholeness and integrity of each person

Elements	Conventional medicine	CAM
Credibility	• Dominant medical system in West and in U.S. • Standard of treatment/care • Conventional medicine is the baseline against which alternatives are measured • Physicians label 'alternative' any type of medicine that they have had the least amount of training in	• Complementary medicine gains credibility from its coexistence with conventional medicine • Alternative medicine is not credible but alternative • CAM therapies used to treat ill health which are not the 'standard of care' in conventional medicine • Gaining credibility because of the increase in interest and use of CAM
Worldview	• Emphasis is on separate things e.g. organs, molecules, atoms etc. • Medical paradigm may be at odds with the ideas, worldview and needs of patients • Reductionism • Materialism • Mechanical/energetic • Matter/energy • Cause/effect • Scientific knowledge	• Changes in conceptualisation of health and wellness • Changes in ideas of how health is achieved • Well-being is a quality that is in demand across various social contexts • Importance of spirituality and a holistic worldview • Challenge to 'paternalistic progressivism and hegemony of conventional medicine • Acceptance by users because of correlation with own beliefs and values about life and health • Holism • Vitalism or the nonmaterial energy in living organisms • Life-world knowledge
Chronic disease	• Disease is chronic and therefore is treated as is all disease by standard cures • Lifestyle factors not significant	• Prevention of disease • Some chronic diseases are preventable and even reversible • Lifestyle factors are significant
System versus practice	Considered to be regular practice according to natural science, laws of biology, based on clinical trials that provide reliable knowledge	• Considered to be practice rather than system • Practice is irregular • Practices foster empowerment, control and agency
Focus	• Focus on cure, intervention, trauma, disease and treatment of symptoms; physical and psychological • Is technical	• Focus on individual and not on entities of disease • Focus on health, healing and well-being. • Importance of lifestyle factors • Based on understanding of complexities of well-being of the body, mind and spirit • Normal balance and restoration are important in HP
Orientation	Negative as it studies the people who get sick	• Oriented towards belief system that health is a personal responsibility • Lifestyle is a choice
Etiology	• Single agent causes a single type of disease and a specific therapy is used to treat that disease • Disease is caused by pathogens-bacteria or viruses or biochemical imbalances • Body is viewed as a machine and disease a breakdown of that machine	• Disharmony stresses the body and may lead to sickness • Disease is disturbance in homeostasis and balance in the system
Health	Absence of disease	• Prevention of illness • Maintain optimal health

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Elements	Conventional medicine	CAM
		• Balance of body systems: the mental, emotional, spiritual, physical, and interrelationship in a state of wholeness. • More holistic and empowering • Fosters wellness and the importance of personal choice and responsibility • Importance of information to make informed lifestyle choices • Is a crucial personal resource
Therapeutic modalities	• Symptom-relieving effects of synthetic drugs and surgeries and radiation • Suppress symptoms both physical and psychological	• Science and art of curing, preventing, alleviating ill health using those modalities which are in harmony with the laws of nature in as simple and natural a way as possible • Strengthen the natural resistance and healing agents to act against the disease • Avoid dangerous side effects • Lifestyle therapies are more beneficial
Diagnostic methods	Scientific tests are used	• Tests are used in conjunction with information from patient • Some tests used are considered unscientific (e.g. pendulums)
Attitude toward person	• Patients seek treatment only when they become ill • Impersonal attendance to a disease entity, uncaring and technical emphasis • Objectification, disempowerment, devaluation may be experienced by patients • Patient is someone who endures; is passive and follows doctor's orders • Focus on specific area in specialisations • Conventional medical doctors seldom consider that a person's attitude towards life shapes the life's quality and quantity • Manipulation of the patient's body as a form of intervention in order to re-establish a statistically derived norm	• Person and problem perceived in a holistic way • Partnership between person and practitioner is valued • Is responsible for health • Spends time • Attends to spiritual and emotional concerns • Considers that a person's attitude towards life shapes the life's quality and quantity
Self-care approaches	• Medical practitioner is informed, is the authority and dispenses treatment • Patient is dependent	• Patients are students of, active participants in their own care • Patients are informed • Self-care is true primary care • Higher incidence of self-prescription of remedies
Research	• Biomedical research has proved practice is scientific and effective and use of drugs is approved • Deductive • Cause is important for cure • Has increased its legitimacy and authority	• Intuitive and patient centred • More holistic and empowering than conventional medicine which has been legitimised by research • Increasing need for evidence-based medicine to deal with lack of research • Lifestyle factors approached from simple, natural orientation
Risk according to patient	• Perception of patient of risk associated with power of medicine • No real sense of choice	• Perceived as less risky because of simple, natural approach • More congruent with own values and beliefs

Elements	Conventional medicine	CAM
		• Requires more information to determine what is beneficial versus harmful • Quality of information is important
Risk according to practitioner	• Limited risk because of research and scientific tests • CAM perceived as 'quackery' or unproven and therefore risky	• Use of lifestyle intervention and dealing with risk factors in a simple, natural way is less risky • Conventional medicine risky because of use of toxic drugs, invasive procedures and surgery
Limitations	• Failure of access and universal coverage for all • Expensive • Patients believe that practitioners have limited success in treating a variety of common complaints • Failure to address the chronic disease burden • Lifestyle risk factors not emphasised • Is 1-3rd leading cause of death due to infections, drug reactions, medical errors, negligence etc. • Dominance of pharmaceutical industry in research agenda	• Group of diverse health care systems and practices, products that are not currently considered to be part of conventional medicine (alternative) • Not perceived as scientific or proven; less legitimate • Less financially and institutionally accessible

This comparative analysis identified some of the main reasons why there is an increasing interest in CAM. An important reason is the limitations experienced in the conventional medical worldview on health and healing by the consumers of CAM.

Reflection on this analysis identified that the CAM approach is congruent with a worldview in which lifestyle and informed choice is promoted. Prevention and reversal of disease are linked. The approach to health evidences a range of beliefs and worldviews in which holism is valued. Health is recognised as respecting the laws of nature and that simple factors such as lifestyle choices are promoted and influence one's health. A significant finding is the importance of information and the need for information on wellness.

In the U.S., the importance of CAM was recognised by the government. The Office of Alternative Medicine (OAM) was established in 1991 as part of the National Institutes of Health (NIH). This office was renamed the National Center for Complementary and Alternative Medicine (NCCAM) in 1998 (Milan *et al* 1998:563*).* At the beginning of the 21st century, the U.S. Congress and

the President requested a Commission of conventional physicians and researchers, CAM pioneers, citizen advocates and business people to design a blueprint for a new medicine that is both scientific and inclusive (Gordon 2004:21). The task of this Commission was to establish guidelines for scientifically exploring approaches and practices that flourish outside of conventional care; to gather information about and describe models that integrate the most effective and safe practices into conventional care; to make this information available; to recommend legislative initiatives that will make the best of these therapies and training in them, integral to medical and other professional education. Additionally, the Commission assumed another responsibility, that of addressing ways complementary and alternative therapies could enlarge and enrich a nationwide approach to HP and wellness (Gordon 2004:21).

The rising interest in CAM has been evidenced in the number of people visiting complementary and alternative health practitioners, the money spent on CAM products and services – $40 billion in 2005 – and the reasons why CAM practitioners have been visited more than conventional practitioners (Hyman 2005:20). People are interested in the restoration of balance in their lives and health, closer partnerships with practitioners and being educated in tools of self-care rather than the mere amelioration of symptoms. Figure 2.4 reflects the most recent release of statistics by the NCCAM (2004) on the use of CAM in which 36% of U.S. adults over the age of 18 used some form of
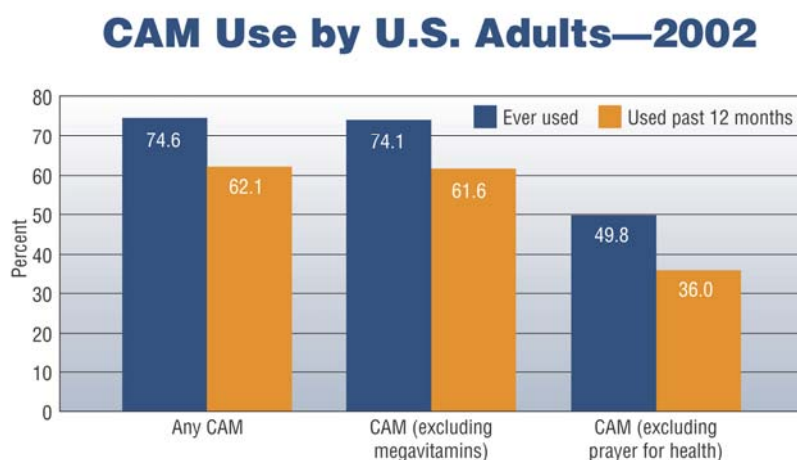
Figure 2.4 CAM use by U.S. Adults - 2002

CAM. A national study by Eisenberg *et al*, as quoted by Milan *et al* (1998:562), showed that one in three respondents reported using at least one alternative therapy to treat a serious medical problem during the previous year. Figure 2.5 reports on reasons why people use CAM (NCCAM 2004):
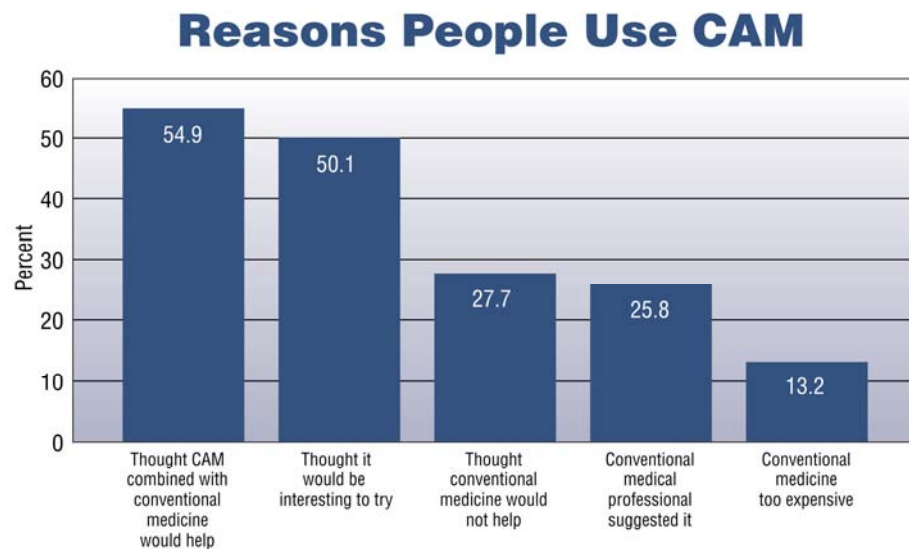
Figure 2.5 Reasons people use CAM

According to WHO (2003d), there is an increased interest internationally in CAM. In Europe, North America and other industrialised regions over 50% of the population have used CAM at least once. 70% of Canadians have used CAM at least once. In Germany, 90% of the population have used a natural remedy. 75% of people in South Africa who are infected with HIV/AIDS use CAM. In the United Kingdom, $230 million is spent annually on alternative medicine.

Many individuals seek an approach that incorporates more than the physical dimension to their care, one which includes a spiritual dimension such as prayer (Barrett *et al* 2003:937; Eisenberg *et al* 1993:246-252; Hildreth & Elman 2007; Milan *et al* 1998:562; Schuster *et al* 2004a:351; Sointu 2006). Seeking an integrated or more holistic approach often occurs after having lost trust in and exhausting conventional therapies.

Individuals using CAM report a desire for a more holistic, personalised and patient-centred approach, with an emphasis on well-being, HP and disease prevention.

2.2.3 Health promotion and disease prevention

The definition of heath promotion used in this study is a composite of definitions and descriptions as researched in the literature (Breslow 2000:40; Jamner 2000; Merrill, Friedrichs & Larsen 2002; O'Donnell 1986:4; O'Donnell 1989; Schuster *et al* 2004a:350; Sointu 2006; UK Department of Health 2008; WHO 2002b; WHO 2003a; WHO 2005a; Yach 2002; Ziglio 2000). Health promotion will be defined as the science, art and provision of health information to support rational choices about the prevention of disease, the individual's ability to function and perform daily activities, lifestyle change and promotion of health towards a state of optimal health. Optimal health is the balance of physical, emotional, social, spiritual and intellectual health with emphasis placed on themes of well-being and quality of life. HP initiatives in the context of the emergence of CAM and as a response to the burden of chronic disease are oriented towards the prevention of disease. This discussion will focus on HP initiatives, approaches to health and the orientation of HP.

Research data evidences that a lifestyle associated with the consumption of a diet of whole grains, vegetables, nuts and fruits, the avoidance of meat and high-fat animal products, moderation in the amount of food eaten, regular exercise and abstinence from alcohol and tobacco promotes health, protects the body and reduces the risk of major chronic diseases that kill at least 500,000 people every year (Campbell & Campbell 2004:3; Craig 1999:25; Fuhrman 2003:53; Meadows 2003:19; Spangler-Murphy 2005:57). Emphasis needs to be placed on the prevention of disease and the need for HP programmes to provide information and education about risk factors (Merrill, Friedrichs, & Larsen 2002; Minkler 2000; Schuster *et al* 2004b; WHO 2002a&b; WHO 2003a; WHO 2005a; Yach 2002; Ziglio 2000). A sense of ownership needs to be fostered for personal control of risk factors such as

physical inactivity, smoking, overweight or obesity, high blood pressure, high blood cholesterol and diabetes.

Strong *et al* (2006) suggests that the prevention of the major chronic diseases is achievable through simple, inexpensive prevention of these known, modifiable risk factors. Many countries such as India and China are already actively engaged in prevention activities. Whittemore *et al* (2003:341) use the example of the Diabetes Prevention Programme in which a 59% reduction in Type 2 diabetes development was achieved by focusing on diet and exercise. It was found to be better than a pharmacological approach. The International Union Against Cancer (UICC) (2007) claims that about 40% of the 11 million cases of cancer worldwide can be prevented by applying existing knowledge that is based on evidence.

Epping-Jordan, Senior Programme Adviser, Chronic Diseases and Health Promotion (WHO 2005b) stated:

> there is simply no justification for chronic diseases to continue to take millions of lives prematurely each year when the understanding of how to prevent these deaths is available now… We must stop the global epidemic of chronic disease.

The fact that these killer diseases are caused by lifestyle choices that every one of us makes on a daily basis reinforces the need for this study. It is our personal responsibility for making informed choices about lifestyle.   Health information is required for this purpose.

HP programmes (*2002 budget promises…*2002:1; Merrill, Friedrichs & Larsen 2002:497; Stokols 2000:22) worldwide are recognising the importance of an orientation towards disease prevention.   International government and workplace initiatives include the European Network for Workplace Health Promotion (ENWHP), the European Foundation for the improvement of living and working conditions, the Australian Institute of Health and Welfare (AIHW) and the Canadian Centre for Occupational Health and Safety (CCOHS). Wilson, Plotnikoff and Shore (n.d.) report on initiatives by the Working Group

on Workplace Health Promotion of the Canadian Consortium of Health Promotion Research and the Canadian Labour and Business Centre. In South Africa, The South African Medical Research Council's (MRC) Health Promotion Research and Development Group (MRC 2007) are part of the government's HP initiative. WHO (2006) has initiated a global strategy on Diet, Physical Activity and Health (DPAS) at country level with a framework and indicators for monitoring and evaluation. Organisations and federations that focus on the importance of HP and disease prevention include the IDF and the International Obesity Task Force (IOTF). In the U.S., the web site HealthierUS.gov is a joint venture of the Executive Office of the President and the Department of Health and Human Services. It aims to be the source of credible, accurate information to help Americans choose to live healthier lives. The President's 2004 budget requested $125 million for Steps to a HealthierUS (Bush 2002).

Workplace initiatives in various organisations such as Motorola, Union Pacific, Caterpillar, Northeast Utilities, Pfizer, Johnson and Johnson and DaimlerChrysler have been reported in Gleckman & Carey (2002), Gonzalez (2005), Minkler (2000) and NCHS (2002).

The orientation of HP initiatives reflect either the conventional medical approach to health and/or CAM's approach to health and healing. It includes initiatives on a personal level. The impact of unhealthy consumption is documented in WHO's (2002b) *World Health Report*. Dr Gro Harlem Brundtland, Director-General of WHO, states in the report that we all need to confront unhealthy choices (Yach 2002:1343). Strategic actions include the surveillance of people's diets, physical activity and related disease burden and enabling people to make informed choices and take effective action. This infers that the individual and his/her responsibility to make wise and informed choices are at the crux of the matter of HP, disease prevention and wellness.

However, choices concerning health are becoming more difficult for many people as there is an abundance of health information available. The purpose of this study is to make health information accessible to facilitate individuals'

taking personal responsibility for their health, as well as making personal informed lifestyle choices. At the heart of HP is an emphasis on the individual's ability to function and perform daily activities, as well as themes of well-being and quality of life. This evidences a theoretical if not empirical acknowledgement of the multi-faceted and complex nature of health and well-being (Breslow 2000:40; Schuster *et al* 2004a:350).

Merrill, Friedrichs and Larsen (2002:499) observed that people's perceptions of how to stay healthy does not necessarily correspond with their actual health behaviours. Many admit that exercise and a healthy diet are important and yet do not practice these. A sad result is that a decision to make lifestyle changes may only come when the motivation, based on illness and recognition of risk, is realised.

The emphasis on HP in terms of government and workplace initiatives and the increasing interest of the lay person/consumer justifies the need for health information. It also provides a rationale for providing the lay person/consumer with reliable information that has been sifted and selected for them to make informed decisions without the possibility of bias and independent of government and workplace initiatives.

Within this study, it is important to identify a particular approach to health that characterises a state of optimal health in which there is a balance of physical, emotional, social, spiritual and intellectual components of well-being. The reason why it is important to explain the concept 'wellness' is that it helps to clarify the provision of information to the health information seeker, the focus of Chapter three. Wellness is the framework for identifying principles of health for the purpose of the selection and organisation of resources for the database as discussed in Chapter four.

The limitations of conventional medicine, manifested in the actions of the patient, have contributed to an increased interest in alternative approaches which emphasise health and healing and foster the idea of wellness. A

reconfigured notion of health care, that of wellness enhancement – an approach in which personal choice and responsibility are basic to achieving optimal health – characterises the new worldview (Schuster *et al* 2004a:350).

2.2.4 Wellness and informed personal lifestyle choice

Breslow (2000:41) suggests that wellness as a concept and health goal is still relatively ill-defined. It has not been standardised or made explicit so as to permit clear delineation in a person or a population measurement. Wellness promotion implies a step beyond prevention of disease and impairment and the actions to achieve higher levels of health. Whereas prevention of disease and impairment have been well delineated, wellness has not (Breslow 2000:41). Jamner (2000:1,3), Breslow (2000:41) and Schuster *et al* (2004a:351) suggest that a consensus is developing about the definitions of health to encompass the physical, psychological, social and spiritual domains in which wellness – a higher order construct – integrates these domains and includes the level of individual self-perception of health. This is correlated with making a change in lifestyle, not just mapping the human genome. Many of the same things that should be confronted in order to prevent disease also need attention in achieving wellness. Disease prevention and wellness promotion constitute two aspects of a positive health strategy (Breslow 2000:41). Craig (2005b:3) states that wellness is a journey - a state of being - not a destination. Wellness is an earlier stage approach to health. It is necessary to make wellness as a state of health more explicit in order to advance understanding of how to promote it. This constitutes an important, current challenge to health science (Breslow 1999:1030-1033).

The Merriam-Webster online dictionary (2004, s.v. 'wellness') defines 'wellness' as: "the quality or state of being in good health especially as an actively sought goal". The *Oxford English Dictionary Online* (2004, s.v. 'wellness') defines 'wellness' as: "the state of being well or in good health". The National Wellness Institute (n.d.) defines 'wellness' as an "active process through which people become aware of, and make choices towards, a more successful existence". Wellness is multi-dimensional, wholistic, a conscious,

self-directed and evolving process of achieving full potential encompassing lifestyle, mental and spiritual well-being, the environment and is positive and affirming (National Wellness Institute n.d.). A definition of wellness, as stated in a curriculum guide for Saskatchewan Learning (*Definition of wellness* 2003), states that wellness is a choice, a decision that one makes towards optimal health. Wellness is also a way of life, a lifestyle one designs to achieve one's highest potential for well-being. It is also the positive acceptance of oneself. Wellness is the interaction of the body, mind and spirit with the appreciation that everything that one does, thinks, feels and believes has an impact on our state of health (*Definition of wellness* 2003).

Wellness is an wholistic view of health. Wilcox, as quoted by Willis (1997:269) reminds one that wholistic health is:

> All that pertains to the development, preservation and use of the physical and mental powers. It pertains to the food we eat, the water we drink, the air we breathe, the clothes we wear, the houses in which we live, our time of sleep and exercise and relaxation, cleanliness of the person and premises, rational treatment when ill – in fact, all that contributes to the development and use of the wonderful body which God has given to His children.

The whole person and the total well-being and functioning of a system should be the focus. A state of wellness may be achieved when a variety of factors are incorporated and balanced into one's lifestyle (Craig 2005b:3).

Kent (2003) refers to economist Paul Zane Pilzer who predicts that wellness will become the next trillion-dollar industry. Pilzer is of the opinion that wellness is not about a fad or trend, but a new and infinite need infusing itself into the way we eat, exercise, sleep, work, save, age and almost every other aspect of our lives. He further states that the sickness business is reactive, whereas the wellness business is proactive. People voluntarily become customers of the wellness business to avoid becoming customers of the sickness business.

In summary, wellness is a worldview that values a way of life that contemplates life in the context of health. Wellness is a process of taking steps to prevent disease and promote health by making rational choices about lifestyle and the way one lives life. It assumes an wholistic and balanced view of all the dimensions of being a human being, that is the physical, emotional, spiritual and mental. In order to make choices and decisions, information about different options, alternatives, health and medical systems and practices is required.

A discussion of wellness includes the following: wellness strategy; personal choice; use of information; worldview and knowledge; and empowerment and personal responsibility for health.

2.2.4.1 *Wellness strategy*

Nedley (1998:1) postulates that there are two factors that our health is primarily dependent on, namely what we put into our bodies and what we do with our bodies. Wellness is a matter of strategising; of making deliberate choices and taking personal responsibility. A wellness strategy is not the same as early disease detection, as the goal is optimal health with the absence of disease, not ill health with less disease (Breslow 2000:41). It goes beyond just screening and testing, typical of HP oriented towards conventional medicine, to identify risk factors. This approach to health includes becoming an informed health seeker. Disease prevention and wellness promotion constitute the two aspects of a positive health strategy. Attention to the broad system of health beliefs and values, ranging from self-perceptions to socio-cultural definitions of health and health care that activate health-related behaviours, is an important aspect of a wellness strategy (Schuster *et al* 2004a:351).

2.2.4.2 *Personal choice*

Health assumes that one uses the human faculty of reason to decide how to live and make personal lifestyle choices. Rationality is a key characteristic of

humanness (Shine 2001:s145). Cousins (1983:229) suggests that the individual presides over the totality of him/herself. Several levels of action are desirable, namely individual, interpersonal and social. In behaviour affecting one's own health, which is an increasingly important factor, the individual makes the final decision ultimately determining what and how much to eat, how much alcohol to consume, and the like. Opportunity and inducements for individual health-related choice should be the intervention and target because health determinants currently consist largely of access, rather than exposure, to risk factors. This choice is not exercised in a vacuum as it is done in the context of family, friends, peers, professional advisers and the whole social milieu. Therefore, simple appeals to individuals may not be very effective since they constitute only one influence on the choice to be made. Interpersonal intervention may carry considerable weight with the individual because of the substantial tendency to follow such leads (Breslow 2000:42). Probably the most effective level of intervention for behaviour that protects health is the social environment. Disseminating information about the benefits of approaches is essentially what wellness is concerned with. Information is needed for informed lifestyle choice.

2.2.4.3 *Use of information*

Gordon (2004:23) suggests that ordinary people, as well as health professionals, need to understand and use quality information to expand their therapeutic options. Information about what prevents disease also promotes health (Breslow 2000:41). If people learn about the variety of approaches to healing that are available and have easy access to authoritative information about their efficacy and limitations, they are likely to make good decisions (Gordon 2004:23). Godin, Truschel and Singh (2005:80) comment on the fact that health care expenditure will double by 2008, but that the Web has the potential to reduce the cost of health care by providing primary prevention, user empowerment, risk reduction and disease management and chronic care services.

In this section, the importance of reasoning and using information to make informed personal lifestyle choices, in the context of wellness, has been emphasised. The focus of this study is to provide access to health information on the Web which supports the health information seeker in an attempt to achieve wellness. This includes the need for a tool (database-driven web site) that will provide health information to the advantage of the health information seeker to improve lifestyle. Information is available, but the question to ask is whether it is relevant within a specific framework, that is the WELLNESS approach. The eight components of health represented in WELLNESS have been shown, by research in section 2.2.4.4, to make a difference in the context of HP and disease prevention.

Essentially, one's approach to health and healing reflects a worldview. Health systems and practices reflect particular worldviews. Information and knowledge about health assist in making personal choices and decisions.

2.2.4.4 *Worldview and knowledge*

Worldview refers to the framework of ideas and beliefs through which an individual interprets the world and interacts in it (*Oxford English Dictionary Online* 2004 s.v. 'worldview'). The increasing interest in CAM has manifested the importance of congruency between the worldview of a particular practice, for example CAM and that of the health information seeker. This has been a key factor in the growing acceptance of CAM (Hirschkorn 2006; Sointu 2006). Hirschkorn (2006) suggests that this is also a logical outcome of postmodern values. These include a skepticism about the ability of science to provide answers to disease and the rise of new age thinking and acceptance of alternative practices. A basic knowledge of the laws of physiology, the systems of the body, the aetiology of disease and what wellness is, are essential to live a reasonable life and make responsible, personal choices essential to one's life and health. Ironically, the body's systems function to maintain equilibrium and therefore symptoms that manifest themselves as 'disease' are evidence of nature's effort in correcting a problem, restoring

internal balance, expelling poisons and throwing off an offending cause (Weil 1996:6).

One's worldview impacts the way one lives in terms of one's lifestyle choices. There is a lack of empirical research investigating the relationships among an individual's lifestyle choices and self-perceived health and well-being. Research (Schuster *et al* 2004a:352; Whittemore *et al* 2003:342,345) has shown that knowledge and skills are common factors and that lifestyle change requires knowledge and an educational orientation. Other findings include values, beliefs, attitudes, intentions and barriers to change. This reinforces the fact that information and knowledge are important components of the ability to make these choices.

Researchers, such as Willis (1997) and Fraser (2003), represent a specific worldview, that is the Seventh-day Adventist (SDA) perspective, that lifestyle is related to health and wellness. They suggest that the SDA group is a group that warrants research about the relationship between lifestyle and health for the following reasons:

- are similar in certain lifestyle behaviours (e.g. non-smoking)
- have a special interest in health
- have a variety of diets; from strict vegan and lacto-ovo vegetarians to occasional meat eaters and those who eat the same as most of the population
- are highly motivated to participate in health research
- have a sense of mission and interest in sharing the health message with their communities
- their health ideas are congruent with their worldview.

Craig (2005b:3) represents the orientation of the SDA perspective of health and the importance of lifestyle in the pursuit of wellness. Using the acronym 'WELLNESS', Craig (2005b:3) describes the eight components that, when incorporated into one's lifestyle, may enable one to achieve a state of wellness. Figure 2.6 illustrates these.

Figure 2.6 Eight components of WELLNESS

WELLNESS, as an acronym, is used to define the approach used in this study. It reflects a particular worldview. The eight components that comprise this acronym will be used to form the framework for the following: a specific approach to wellness; profile of the WELLNESS health information seeker (chapter 3); criteria for and the selection of resources (chapter 4); thesaurus construction (chapter 5); database design (chapter 6); and web site design (chapter 7).

2.2.4.5 *Empowerment and personal responsibility*

Wellness is a reflection of the trend that individuals have become more concerned about taking responsibility and managing their own health and describes the lifestyle they have embraced (National Wellness Institute n.d.; Sointu 2006; Wellness: finally a…. 2003:5). Individuals should be empowered and encouraged to make positive, life-enhancing health decisions for themselves (WHO 2002b:11). Wellness is a way of defining one's well-being. It is also an approach to health and healing. It identifies what is involved in making informed lifestyle choices. The above discussion has highlighted the importance of information and the availability of and access to

resources in order to make informed lifestyle and wellness choices in the new paradigm. For the burden of chronic disease to be lessened worldwide, more focus should be given to prevention, HP and wellness. For the lay person interested in, and taking responsibility for their own health and wanting to make informed lifestyle choices, the accessibility and availability of information is vital. The role of the information professional is to facilitate easy access to focused, accurate and timely information to inform lifestyle choice. This is done by harnessing the knowledge and skills of their discipline, information science, as well as their experience. It is recognised that they have become part of a multidisciplinary team in the health care sector to provide health institutions and patients with more efficient ways of accessing health information (Feather 2006:7).

At the heart of every profession is the provision and use of information. Health informatics, specifically CHI, has relevance for this study. It is the role of the information professional to develop tools, for example databases and web sites, to provide access to health information. This facilitates informed personal lifestyle choices.

2.3 HEALTH INFORMATICS

Information professionals bring their own body of knowledge, as well as skills and abilities, such as specialised language and vocabulary and judgment about quality and value in the selection and evaluation of resources. Information science is defined as concerned with "gathering and manipulating and storing and classifying recorded information" (Hyperdictionary.com 2005, s.v. 'information science').   Informatics is defined using almost the same words, but includes the use of information (Hyperdictionary.com 2005, s.v. 'informatics').   Frisse *et al*, as quoted by Perry, Roderer and Assar (2005:199), observed that medical informatics is at the confluence between information technology and biomedicine. It focuses on developing and delivering information systems in health care, databases for outcome analysis, decision-making and administration in the health sciences. Traditionally, the practice of informatics has been to provide services, as well

as information to clinical professionals, for example health institutions, patients, doctors and community clinics. Informatics is loosely understood as a science that investigates the use and processing of data, information and knowledge and medical informatics is this science as applied to medicine, health care and public health.

Health informatics has evolved from a multidisciplinary response to the various interests of doctors, hospitals, health maintenance organisations (HMOs), insurance companies and Web firms who are using the Web to retool the business of medicine, namely collect, manage, use and share health information. Health informatics is the study of the role of information in the area of health. Health informatics is defined as "the knowledge, skills and tools, which enable information to be collected, managed, used and shared to support the delivery of health care and promote health" (Health Informatics Community 2006, s.v. 'health informatics'). Health informatics includes all of the activities involved in information organisation and usage within the particular context of the use of technology, information and medicine. The Web has contributed to the proliferation of information resources accessible in the public domain. Conventional medicine has been challenged by this ICT revolution (Feather 2006:4). The availability of health information has given people greater control over their own lives, as well as greater influence in society. The problem is not accessing health information on the Web, but in judging the quality and value of what is found.

At the same time, patients have increasingly been encouraged to take more assertive roles in their own care. The burden of responsibility is transforming the passive participant into an active one, namely the health consumer. The health care consumer is "any actual or potential recipient of health care such as a patient in a hospital, a client in a community mental health centre or a member of a prepaid health maintenance organisation" (*Mosby's* 2002:74).

CHI is a subset of health informatics. It is a response to the emerging need for health information, as discussed in this chapter, in the context of the emergence of a new worldview.

2.3.1 Consumer health informatics

CHI is the branch of medical informatics that analyses consumers' needs for information, studies and implements methods of making information accessible to consumers, and models and integrates consumer's preferences into medical information systems. CHI is concerned with and is a response to the consumer's need for health information. It is a multidisciplinary combination of nursing informatics, public health, HP, and health education, library science and communication science. It is probably the most challenging of the fields in medical informatics. It is paving the way for health care in the information age (Eysenbach 2000:1713).

CHI recognises the autonomy of the layperson and focuses on the study, development and implementation of computer and telecommunications application and interfaces to be used by health consumers (Ferguson & Frydman 2004:1149). The use of 'consumer' and 'consumerism' evidences a shift from medical paternalism and the idea of power and control within the hierarchy of the medical and health care systems towards an acceptance of the autonomous, active patient who seeks information and is involved in the process of making health choices (Anderson 2004; Dutta-Bergman 2005; Ferguson & Frydman 2004; Hogle 2002). It reflects the acceptance of the patient as a consumer, as well as a change of role to that of an empowered user of health information. The e-Health revolution is consumer driven. It involves Web and intranet-related technologies. It represents a field that is at the intersection of medical informatics, public health and business. Besides being a technical development, it is also a way of thinking, an attitude and a commitment to networking in order to improve health, locally, regionally and internationally by making use of ICTs (Eysenbach 2001:e20).

According to some researchers (AMIA 2005; Eysenbach 2000; Eysenbach & Jadad 2001; Ferguson 2003; Ferguson & Frydman 2004; Hogle 2002), CHI:

- analyses, formalises and models consumer preferences and information needs

- analyses consumer's needs for information

- models and integrates consumer's preference into medical information systems

- studies, develops and implements methods of making information available and integrating information management into HP, clinical, educational and research activities

- investigates the effectiveness and efficiency of computerised information and network systems for consumers in their participation in health and health care related activities

- studies effects of systems on public health and the patient-professional relationship and society

- optimises the health care partnership of patient and provider and information delivery system

- includes patients in health care decision-making

- develops technology and software to educate and empower consumers

- evaluates the effectiveness in patient outcomes

- enables consumers to make informed choices by making high quality information available in order to cut health care costs

- makes use of the Web so that consumers can assume personal responsibility for prevention.

In this study, the following working definition of the American Medical Informatics Association (AMIA) (2007) for CHI will be used:

> a subspecialty of medical informatics which studies from a patient/consumer perspective the use of electronic information and communication to improve medical outcomes and the health care decision-making process.

SoRelle (2003) offers a few points on the negative connotations of 'consumer' in the context of health care. These include the idea of shopping and spending money, that is commercialisation. The idea of choice is inferred and for some there is little or no choice when it comes to dealing with genetic conditions or accidents or situations when one is a 'patient'. To be a patient

means that one has rights as a patient - to the best medical care, insurance and to being a patient. Consumer health includes the concept of health literacy which is defined as the "capacity of an individual to obtain, interpret and understand basic health information and services and the competence to use such information and services in ways which are health-enhancing" (Sullivan 2000). Van der Zeijden (2004:2) suggests that the difference between the consumers with an incidental need for health care and the consumers who are constantly dependent on health services to live a productive life should be understood. There should be information for those who desire to take responsibility for their personal health, as well as for those who rely on the authority of health professionals (van der Zeijden 2004:4). In order to make choices, people need access to available information that is understandable, namely that the message is clear, the content relevant and customised, the format is linguistically and culturally appropriate and the information has been tested on suitable audiences.

An issue related to CHI activities is whether the user is to be considered as 'patient', 'consumer', or 'client'. The various terms used refer to different contexts and the way in which the user is positioned. This will impact the nature of the information required and the information need, the delivery system used, the language or terms used and what the perspective should be in terms of target audience and level of information literacy and technological knowledge. It will also affect which values should be embedded in the system and interface designs. Essentially, the goal of this study is to address some of the above issues, namely to understand the issues related to the user (chapter 3), the selection of appropriate and relevant health information sources and resources (chapter 4), the identification of language and terms of a controlled vocabulary in a thesaurus (chapter 5) and the development of suitable delivery systems, that is a database-driven web site in (chapters 6&7).

The Food and Drug Administration (FDA) (2003:1) states that:

Informed customers represent our Nation's greatest public health asset, because the choices people make every day can have a great impact on their own health and the health of the nation. Providing consumers with all the tools they need to make better-informed choices about how to use their health care dollars, and protecting them from misleading information that wastes their money and effort is of the utmost importance to the agency.

The researcher recognized that the consumer of health information, recognised by CHI, is of particular relevance to this study. This is the group that has recognised the need for health information. Chapter three investigates the user as consumer in the context of actively seeking health information. This is an important aspect of this study.

2.4 CONCLUSION

This chapter introduced the various factors, namely the burden of chronic disease; the limitations of conventional medicine; the increasing interest in CAM; HP and disease prevention and the rise of the importance of wellness as an approach to optimal health, which have contributed to the emergence of a new worldview in health care. These factors also highlighted the evolution towards the need for health informatics, specifically CHI, and the importance of the need of the health information seeker for information to make informed lifestyle choices. This chapter provided the background to the emergence of a user group, within the current health care situation, identified as health information seekers. Within this context, a specific group of health information seekers, namely the WELLNESS health information seeker is profiled in Chapter three to inform the development of a database-driven web site of health information resources to facilitate informed lifestyle choice.

CHAPTER THREE

THE USER PROFILE

3.1 INTRODUCTION

The intention of Chapter three is to formulate the user profile of a specific group of health information seekers - that is the WELLNESS health information seeker. Chapter two sketched the background to the emergence of a user group, namely health information seekers, a general group of users interested in accessing and using health information. In the context of the new worldview, there has been a shift from patient, as passive and dependent on a doctor for information about health, to a health consumer, who is actively using the Web to search for health information. The Web has made it possible for anyone, anywhere to access health information at any time. In order to profile a specific user group of health information seekers, it was necessary to analyse the literature (Bond 2004; Bowen *et al* 2003; Dervin 2005; Dutta-Bergman 2004c; Eng 2001; Eysenbach 2000; Eysenbach & Kohler 2002; Flick 1998; Fox 2006; Garrett 2003; Henwood *et al* 2003; Hyman 2005; Krug 2000; Keselman *et al* 2007; Kuhlthau 1991; Moritsugu 2007; Navarro & Wilkins 2001; Nettleton *et al* 2004; Nicholas *et al* 2003; Norman & Skinner 2006a&b; Preece, Rogers & Sharp 2002; Rosenfeld & Morville 2002; Wilson 1981; Wilson 1999; Wilson 2004) to provide a theoretical foundation for understanding the user, their information need (section 3.2), information behaviour in terms of information-seeking and information searching behaviour (section 3.3) and the characteristics of the health information seeker (section 3.4).

The concept of 'information need' is central to the investigation of the user in the context of information representation and retrieval as the ultimate objective is to satisfy the user's information need. Without the establishment of an information need, there would be no reason for the design of a database-driven web site of WELLNESS resources. The multiple uses of

information will facilitate the design process in terms of the organisation, content, purpose and user interface of the tool (database-driven web site) that provides the resources to satisfy the information needs and requirements of the user.

The user model and user survey information presented by the researcher in the original study (Steyn 1999) and set out in Annexure one identified attributes of the user. The attributes of the user, together with the information on the health information seeker, will be used to identify the specific characteristics and information behaviour to profile the WELLNESS health information seeker. Table 3.9 in section 3.5 will outline the profile of the WELLNESS health information seeker and the implications for design to ensure that the design of the prototype database-driven web site is user-centred and that the criteria of usability will have been met. The goal is to provide users with access to WELLNESS information according to their specific information preferences, needs and requirements and to facilitate their information-seeking and searching behaviour.

A discussion of information need should include the user who needs information, what information is needed and the delivery process. It reflects a relationship between the user, the resources and the tool.

3.2 USER INFORMATION NEED

In order to understand the user information need, it is important to explain the concept 'information'. Information, in the context of user studies, can be understood as a physical entity, as in product and medium; as all the facts, conclusions, ideas and works of the human intellect that have been communicated in some form; as channel; as subject data; as advice or opinions or factual data (Feather 2006:3; Reitz 2004-2006 s.v. 'information'; Wilson 1981:3). Buckland (1991:351) suggests that there are three main uses of the concept 'information', namely information-as-process, information-as-knowledge and information-as-thing.

Wilson (1981:4) suggests that information-seeking behaviour results from a perceived need that the user has recognised. Information need is described as the gap between knowledge of the user and the knowledge needed to solve the problem (Chu 2003:168; Kuhlthau 1991:362). Information-seeking behaviour is essentially information-seeking towards the satisfaction of needs and is motivated by the recognition of 'missing' information (Case 2002:76; Wilson 1981:7). User needs include cognitive, affective and physical needs and the interrelationship between these (Wilson 1981:7). Chu (2003:169) terms different types of need as known item need, concrete information need and problem oriented need. These needs differ in terms of whether they are specific and concrete or vague and abstract. Rosenfeld and Morville (2002:32) refer to known-item seeking, exploratory seeking and exhaustive research as ways in which users attempt to satisfy their information needs. Information needs change and vary from user to user. A user-centred database-driven web site should be designed to satisfy the specific user group needs. These needs will be identified in section 3.2.1 in the discussion of the information need of the health information seeker.

Wilson (1981:5) states that the user and technology constitute an information searching subsystem. Information-seeking behaviour needs to be understood in the context of the information need and the information system that is being used to satisfy this need, which is essentially information searching behaviour. The user should therefore be considered from the perspective of technology, task and how he/she relates to technology and the information that it stores and retrieves. User needs may remain unexpressed or poorly expressed. Chu (2003:168) has identified four factors which affect user information needs:

- information sources, that is, the array available has an effect on need
- purpose of the information, for example factual needs are simple and straightforward, whereas research studies are more difficult
- external factors, including social, political, and economic factors
- outcomes, for example what are the results? Are they positive or useless in terms of meeting the information need?

As evidenced in Chapter two, the increased need for health information for personal choice and decision-making in the new worldview, together with the increased use of the Web has resulted in the provision and proliferation of information across all types of media that can provide information to answer the pressing questions people have about their health (Williams 2003:68). Maxwell (1998:xvii) calls this phenomenon a thirst for health information and the many consumers of health information - health information seekers. The information need of the health information seeker will be discussed in section 3.2.1 and his/her characteristics in section 3.4.

3.2.1 Information need of health information seeker

A review of the literature (Bessell *et al* 2002; Cline & Haynes 2001; Forkner-Dunn 2003; Fox 2006; Fox & Rainie 2003; Madden & Rainie 2003; Maxwell 1998; Nicholas *et al* 2003; Princeton Survey Research…2000; Rippen & Risk 2000; Tyson 2000; Williams 2003) established the information needs of health information seekers. These health information seeker needs are for information about:

- self-care for themselves and for others, i.e. health management
- specific conditions, disease, diagnosis, treatment and procedures
- clinical trial information
- innovative and experimental treatments and therapies
- health for staying well, for preventing and managing disease
- CAM therapies, practitioners, products
- sensitive health topics
- mental health issues, such as depression, anxiety and stress
- news about health care
- specific doctors, hospitals, medicines, prescription drugs, health care providers and services
- weight control
- online consultations
- support groups

- fitness, nutrition, general wellness, diet, exercise, stress management, relationships
- health products, providers, sources, prices, purchasing
- optimisation of health, the pursuit of wellness and a balanced life
- health decision-making with reference to all/any of the above.

Worldwide, people are taking more personal responsibility for their health today than ever before. There is an increasing interest in lifestyle matters (Fox 2006; Fox & Rainie 2003:3), as discussed in sections 2.2 and 4.2, with an increased focus on prevention of disease, wellness and lifestyle change. Information should be made available to address the needs of the health information seeker, as outlined above, to facilitate informed personal lifestyle choice.

The Web has vast potential to promote and provide access to both regulated and unregulated health information. It has the clientele and the technical requirements to promote interactivity, consumer education and the support for decision-making. It can also provide information which may be beyond what the health care system can provide, that is divergent or alternative information, which can foster shared decision-making, intervention and change of behaviour (Bansil *et al* 2006; Cline & Haynes 2001; Fox 2006; Laing, Hogg & Winkelman 2004; Princeton Survey Research…2000).

In the most recent survey of the Pew Internet and American Life Project, Fox (2006) comments that the Web is increasingly becoming a valued source of health care information for large numbers of health information seekers. 160 million online users sought health information on the Web in 2006 (Harris Interactive 2007). This represents a 37% increase over two years. Daily, about 8 million Americans go online for medical advice rather than actually visiting their health professional (Forkner-Dunn 2003; Fox 2006; Fox & Rainie 2003:4). 66% of Canadians visit web sites offering health and medical information, particularly the Health Canada web site (Public Health Agency of Canada 2003). A study of Web users in Europe by Andreassen *et al*

(2007:53) reported that 71% of Web users had used the Web for health purposes. Health-related use of the Web was most frequent in Germany, Denmark and Norway. Poland and Latvia reported 35% health-related use of the Web. Tatsumi *et al* (2001:e12) report that in Japan doctors are the main users of the Web for health information.

Eysenbach and Kohler (2003:225) report that the information concerning the most common reasons why people go online to search for health information is based primarily on the Pew Internet Survey research. Research conducted by Eysenbach and Kohler (2003) focused on clarifying what the actual prevalence of health-related searches on the Web is in relation to the total number of searches per day. They concluded that 4.5% of all searches on the Web might be health-related, representing about 6.75 million health-related searches. Powell and Clarke (2002:e4) report that 25 million people in the United Kingdom have access to the Web and that 14 million use it regularly. 50% to 70% of these users have looked for health information. They comment on the fact that the limited evidence as to who these consumers are and what they are searching for comes from market surveys and statistics about Web usage in the U.S. They suggest that further investigation of which health topics are accessed, the reasons behind information-seeking and the attitudes and behaviour of health users towards the Web is needed. Identification of who the consumers are, what their information needs are and why they seek information online are important to provide information in beneficial ways on a worldwide and individual level. This supports the importance of this chapter and the need to analyse the literature in order to profile the health information seeker as WELLNESS health information seeker.

Research (Fox 2006; Fox & Rainie 2003; Princeton Survey Research…2000) has identified the following reasons why the Web is valued:

- its ubiquitous nature, namely its global availability 24/7
- its support for reference and research

- access to inexpensive information resources

- convenience and ease of use

- accessibility

- anonymity and confidentiality

- ease of updating information

- its interactive format.

The availability of vast amounts of information could be both an asset and/or a liability to the user as health information seeker, as well as to the health care practitioner. Problems with using the Web as retrieval tool are discussed in section 3.3.2.1. In section 4.4 problems associated with the quality and reliability of information found on the Web are discussed. These issues reinforce the relevance of this study, that is the organisation of health information reflecting a particular worldview in a database-driven web site to support user information needs and decision-making.

In discussing the information need of the health information seeker, it became evident that it is closely linked to the use of the Web. This raises the issue of user information behaviour and the factors that contribute to the evolvement of information-seeking and searching behaviour. Therefore user information behaviour requires investigation and discussion.

3.3 USER INFORMATION BEHAVIOUR

Understanding the user as health information seeker includes an investigation of user information behaviour in general. Information-seeking behaviour, a sub-set of information behaviour, is concerned with the variety of methods people use to discover and gain access to information resources. Information searching behaviour, a sub-set of information-seeking, is concerned with the interactions between the information user and computer-based information systems such as the database-driven WELLNESS web site as information retrieval system (Wilson 1999). User information search behaviour includes an investigation of search processes and the nature of the Web in terms of

search and retrieval capabilities, as well as problems with Web search and the use of portals and search engines in general. Section 3.4.7 details the search behaviour of a specific user group, namely the health information seeker.

The process of acquiring information is integral to the information age and is central to all of life's interactions. Wilson (1999:255) suggests that information behaviour, including information-seeking and searching behaviour, is the "activities a person may engage in when identifying their own needs for information, searching for such information in any way and using or transferring that information". The ability to seek and find information, as well as evaluate and use it is important. An wholistic view of the user should include the affective, cognitive and physical activities and needs of the user, as well as the situation and context of the user in the process. The phenomenon of the network society has brought information into the home, to the desktop and to portable hand-held devices (Feather 2006:4). The mobility of these information devices has created challenges to develop systems that support the user in his/her search for information (Wilson 2004). Ordinary people are enabled to take greater control over their lives and the affective, cognitive and physical activities and needs of the user, together with the situation and context in which the user requires the application of information, are determinants of user behaviour. The consequences of this in the health care arena are that the role of the individual is no longer merely that of 'patient' or 'sick', but that of a 'health role' and becoming an informed self, an active participant who requires health information (Kivits 2004:526).

Wilson (2004) reports that in his research he found that people expressed that their lack of skills to search effectively led them to depend on the information professional because of the belief that "he or she knows how to do it". Information science is concerned with information in terms of satisfying the user information need. For design to be user-centred, the information professional should design the retrieval system with the needs of the user in mind. The information professional generally approaches information from the bibliographic paradigm which centres on collecting and classifying texts

and preparing search strategies for retrieval and reflects a process of order and certainty (Feather 2006:6; Kuhlthau 1991:361). The bibliographic paradigm is intended to answer well-defined questions and may not recognise various problem states or feelings of the user. The approach of the user to his/her search behaviour may differ to that of the information professional. This has implications for search behaviour and should be taken into consideration. The user information need cannot just be understood as looking for the right answer. The user's natural process of finding information is one of uncertainty and even confusion. Understanding the approach of the user as opposed to the information professional is basic to user-centred design. User-centred design is oriented towards user information-seeking behaviour and user satisfaction of information needs.

Information is needed to extend the user's state of knowledge on a particular problem or topic. It is essentially a process of sense-making and forming a personal point of view within a personal frame of reference. This approach is reflected in Dervin's (1992, 1998, 2005) needs-based model of sense making. The model focuses on understanding the user situation, gaps in knowledge and the use of information.

According to Wilson (2004), the information professional should assume that information users will adopt very simple search strategies. Therefore systems should be designed to either infer complexity from the simple terms entered in a search or an interactive process should be provided for the expression of more complex requirements.

When designing a database-driven web site, it is important to understand the information needs of the user and their search behaviour. A question to be considered is, what does the user do to find information? Rosenfeld & Morville (2002:32) suggest that the process includes the following: entry of a query in a search system and browsing of links. Information-seeking behaviour includes searching, browsing and asking, as well as the integration and iteration of these behaviours. Information retrieval is more than a process in which a user enters a query and then is provided with matching results. This is an oversimplification of a complex process which should take into

consideration the actual user needs, situations, behaviours and gaps in knowledge. This is basic to the design process of the database-driven web site as discussed in section 7.2.

This discussion is not focused on a critique of models and representations of information behaviour and information searching. It reports on the different aspects of understanding the user and his/her information need and information behaviour to develop a framework for understanding the WELLNESS health information seeker. As Wilson (1999:250) suggests, models represent various aspects of information-seeking behaviour and are complementary.

Search behaviour involves making choices, evaluating the usefulness of the information with respect to the problem or need and assimilating the new with what is known to become a product or knowledge. To understand suggests a vicarious experience with the user in the health information-seeking activities and search processes. In the context of this study, the search processes, the nature of the Web to facilitate search and retrieval, problems with Web searching, the use of portals and search engines, and user interface are important aspects to be discussed, as the user is always central to the design process.

3.3.1 Search processes

The user encounters information in different ways. In order to understand the user's perspective, researchers (Bond 2004; Flick 1998; Graci & Odendahl n.d.; Krug 2000; Kulthau 1991; Medin 1989; Preece, Rogers & Sharp 2002; Rosenfeld & Morville 2002; Schank & Kass 1988) have used different terms and metaphors to describe these search processes. These include cognition, cognitive scaffolding, mental models, affective experience, emulation, conceptualisation, information-seeking process and information processing. Understanding the way the user searches for information will inform the design process. Table 3.1 outlines these processes.

Table 3.1 Search processes

Type of process	Explanation of process
Cognition – questions about the nature and use of knowledge.	Internal: Human cognitive processes, e.g. thinking, remembering, learning, daydreaming, reading, writing, talking, attention, perception, recognition, memory, speaking, listening, problem solving, reasoning, planning, decision-making. External: Explanation of the cognitive processes involved when one interacts with different external representations. Theories, models, conceptual frameworks provide abstractions for thinking about phenomena such as user interaction and prediction of user performance.
Cognitive scaffolding (Flick 1998) – functions to create associations between ideas.	Provision of support such as vocabulary and information architecture to give structure and framework for presentation of resources for making informed choices and is the core of usability for the purpose of intervention and decision-making for behaviour change.
Mental models – internal constructions of some aspect of the external world that are manipulated in order to make inferences and predictions.	A conceptual model that enables users to readily learn a system and use it effectively. Systems are designed to match as closely the mental models of intended and potential users in order to respond to user input in intuitive ways of interaction with the system. This includes clear, easy-to-follow instructions, online help, context sensitive guidance for users matching their level of experience and ways to proceed.
Affective experience – includes mood, attitude, stance and motivation.	Feelings of confusion increase as the disconnect between personal knowledge and the unfamiliar is confronted. This results in either questioning the validity of the new information or the formation of a new construct which is incorporated into the existing system.
Emulation – understanding real-world, everyday activity.	A design strategy to support or extend the user in tasks by understanding the nature of the problem in relation to various coping and externalising strategies developed to deal with the physical world.
Conceptualisation – concepts are labels assigned to ideas, objects, thoughts.	Conceptual structure recognises patterns and relationships between concepts and mental conception of a structure in order to match user requirements and the conceptual schema. This refers to one's body of knowledge and the way in which ideas and concepts have been structured. It views a web site as a structure of concepts and represents a body of knowledge about something.
Information-seeking process.	This is a constructive process consisting of 6 phases; initiation, selection, exploration, collection and presentation. It considers the typical thoughts, actions, and feelings of the searcher during these phases (table 3.2).
Information processing – describes how the mind conceptualises the information to support this process.	These activities include browsing, searching, seeking, surfing, comparing, matching. Information enters and exits the mind through a series of ordered processing stages which are assumed to act upon mental representations including images, mental models, rules, etcetera.

The researcher has selected the problem-solving model of Wilson (1999) for inclusion in this study because it is important to understand user information behaviour in the context of solving health problems. Figure 3.1 emphasises the importance of identifying the problem and moving towards the stage of increased uncertainty as the solution is found. If the uncertainty resolution loop fails, the user will have to return to the problem which is the information need. The solution of the problem, moving from uncertainty towards certainty, becomes the goal of the information-seeking behaviour. The stages that the user experiences are addressed in the model; problem identification to solution statement.
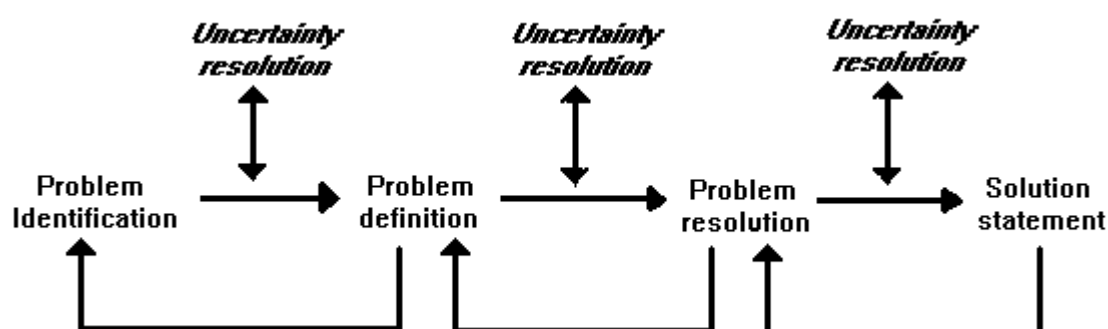
Figure 3.1 Model of problem-solving (Wilson 1999)

Kuhlthau's (1991:367) model of the information search process (ISP) has six phases and considers the thoughts, actions and feelings typical of the searcher in different phases. Table 3.2 outlines this model.

Table 3.2 Information search process (ISP) (Kuhlthau 1991:367)

Stages in ISP	Feelings common to each stage	Thoughts common to each stage	Actions common to each stage	Appropriate task according to K model	Task as reported by participants
Initiation	Uncertainty	General/ vague	Seeking background information	Recognise	Gather
Selection	Optimism			Identify	Gather
Exploration	Confusion/ frustration/		Seeking relevant	Investigate	Gather/ complete

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	doubt		information		
Formulation	Clarity	Narrowed/ clear		Formulate	Gather/ complete
Collection	Sense of direction/ confidence	Increased interest	Seeking relevant, focused information	Gather	Complete
Presentation	Relief/ satisfaction or disappointment	Clearer or focused		Complete	Write or present

Dutta-Bergman (2004c) refers to the Elaboration Likelihood Model (ELM) of Petty and Cacioppo and the Heuristic-Systematic Model (HSM) of Eagly and Chaiken to distinguish between the surfing and searching activities of the user. Surfers are drawn to what is interesting and are concerned with source-based criteria, whereas searching is a planned activity characterised by goals and the need for relevant information and has message-based criteria. Users evidence different search behaviours of which the information professional should be cognisant.

A brief discussion of the nature of the Web, with reference to its search and retrieval capabilities, will facilitate the discussion of the user search behaviour related to web sites, which is relevant for the development of the prototype database-driven web site.

3.3.2 The nature of Web search and retrieval capabilities

The search processes described above in section 3.3.1 should be investigated with reference to user search behaviour in the Web context as the nature of the Web influences user search and retrieval. Users expect that when they use the Web, click on a word or type in a keyword in a search box in a search engine that information will be instantly retrieved. As Krug states (2000), the user does not want to have to think about their search behaviour. This discussion will facilitate the design of the WELLNESS database-driven web site in Chapters six and seven.

The literature (Danaher, McKay & Seeley 2005; Garrett 2003; Hanson 2006; Harrison 2005; Krug 2000; Lancaster 2003; Nielsen 2003; Preece, Rogers & Sharp 2002; Risk 2002; Rosenfeld & Morville 2002), concerning the nature of the Web and its searching and retrieval capabilities, was analysed. The Web, as an information resource, provides a global information network for the storage and retrieval of information. Searching and browsing are the most important attributes and facilities of the Web. Information represented and organised systematically in a database can only be searched and retrieved when there is a search mechanism. A typical interaction on the Web involves the submission of information from a user using a browser (for example Internet Explorer or Mozilla FireFox) to a web-based application such as a search engine or web page. The Common Gateway Interface (CGI) allows the server to interact dynamically with the user. The web browser facilitates search and retrieval as follows:

- by finding a web server somewhere else on a network
- requesting a copy of a file from the web server
- knowing how to translate that file into a web page using the contents of the file, which are typically hypertext markup tags, as defined by hypertext markup language (HTML) (Hanson 2006:65).

In a search, the user requests the home search page (such as the Google search page) from the search engine server and uses it to submit a search term or terms. The server then 'dynamically' uses those search terms (by running a program) to find the requested material, repackage it and send it back in a new web page to the user. The system can only present results that match the query (Chu 2003:82). The results of this search can then be browsed and by following links the user can search those resources that were retrieved by the search engine. Another way of searching is for the user to know the exact URL of the web site they wish to access and navigate through that particular web site's pages (Hanson 2006:72). Cookies are used by the server to remember information about the users. The fact that a web site can identify a specific user, tailor results to their perceived need and remember

information about them can be useful, but also a concern with reference to privacy (Hanson 2006:73). Health information seekers search for information on the Web because of its perceived environment of privacy and confidentiality. However, they need to take note of the potential privacy issue mentioned above.

Some of the searchable elements of the Web and web sites are: URL, site name, metadata included in the site, text in the site and homepage. The Web is mainly menu and keyword-search organised and driven. This allows quick access to any of the information resources and to parts of information. Hypertext linking is a key searching and retrieval function available on the Web. Keywords provide access to many documents and to text within sources. Links provided on a web site allow the user to access full text if and where available. Lancaster (2003:337,349) refers to the fact that because two sources are linked suggests that there is a link between them and that there is a form of indexing inherent in the structure of the Web. The link terms may also be searchable thus making a site a node in a network.

As discussed in section 3.2, health information seekers are turning to the Web for health information because of its search and retrieval capabilities. The growing use of the Web, as well as its search and retrieval potential, influenced the decision to develop a database-driven web site. The researcher should be cognisant of the problems associated with Web search and retrieval, as they may influence the design process.

3.3.2.1 *Problems with Web search and retrieval*

There are problems in searching and retrieving information via the Web that should be noted (Chu 2003:138; Lancaster 2003:342, 343, 347, 348):

- although Web searching is becoming more sophisticated it is generally narrow and shallow
- millions of hits may be retrieved but may not satisfy information needs

- nuances of search algorithms and results rankings may influence retrieval results and not be understood by the user

- there are many databases on the Web but these may not be directly searchable as they may be located but their contents are not included in any of the search engines

- in order for web sites to be found, developers have used 'spoofing' or 'index spamming'. Essentially this is repeating keywords or blending keywords into the background

- bias may be created by the search engine by its selection of the sites it provides access to

- some information may be disinformation, for example medical information that is unauthenticated. The user has to take responsibility for judging the quality of information

- information may not be accessible because links may be dated and broken.

3.3.2.2 *Use of portals*

Portals provide efficiency and convenience for the user as they store frequently used information, resources and tools in one location. These can provide speed and efficiency in dealing with daily information needs. From the service provider's perspective, the portal is a way of laying out all they have to offer in one place and offer a simplified page and a portal page for the user to make a choice (Hock 2007:28). The way in which the user searches for health information is affected by the use of portals as it provides a one-stop shop. Searching one location provides access to many resources that have been selected with a particular focus. Portals are becoming more important in the health care arena.

3.3.2.3 *Use of search engines*

Every day millions of searchers use search engines. It has become very easy for the user to search for anything in a fraction of a second and retrieve

content buried in deep links. Search engines allow the user to search and navigate the estimated 30 billion web sites available on the Web. Without search engines, which catalogue less than 10% of the Web content, users would have difficulty even finding information within that 10% (Gil 2006). The 'Invisible Web' comprises the remaining 90% of the Web. However, the use of search engines, especially 'Google' and the search activity of 'Googling' has had a significant impact on the search behaviour of medical doctors, practitioners and patients as users of health information. Its ability to help doctors diagnose difficult cases has been recognised (Buchholz 2005; Crespo 2004; Davies 2007; Gardner 2006; Giustini 2005; Hawkes 2005; Lowes 2007; Tang & Ng 2006).

3.3.3 User interface

User interface refers to the interaction of the user and the system (Chu 2003:171). The user interface can positively or negatively affect user search behaviour. It is an important aspect of design and has relevance for this study.

Modes of user-system interaction include command language, menu selection, graphical operation, form fill-in, hyperlinks, natural language and hybrid mode. Modes can be presented in parallel or simultaneously (Chu 2003:171-175). Other dimensions of user-system interaction include display features, output options and help facilities (Chu 2003:175-178). Table 3.3 identifies the main aspects of the interaction between the user and the system, that is the interface.

Table 3.3 User and system interaction

User	System
Command language: artificial language designed for retrieval e.g. login	• Not friendly to user as it is jargon • Is mostly an interaction mode between IR and professional searchers • Little uniformity between different command languages e.g. exit and logoff
Menu selection	• Is created to deal with limitations of command language • Menu allows user to choose from available options • No need to memorise commands • Menus are specific to retrieval

User	System
	• Is slower than command language but more user friendly • Flexibility of user is limited to what the system supplies • Useful for novice users
Graphical operation	• Icons, buttons, windows, clickable maps • User points or clicks on the visual representations • Supports usability and enjoyment • If activities are poorly or inappropriately represented then user is not supported and can be confused • May slow down the retrieval process
Other modes	• Form fill in i.e. fill in search terms in buttons and/or pull-down menus • System guides user through process of query formation and submission • May restrict user if mode is limited • Hyperlinks allow searcher to click on a link and be led to another entity • Supports browsing • Networked structure may cause the user to get lost • Internal structure may be a maze rather than a well-organised collection of links • Natural language allows the user to enter in complete sentence queries • Allows directness and there is no need to interpret the meaning of the representations
Hybrid mode	• Combination of all of the modes can eliminate the limitations of the single mode
Display features	• Interaction takes place via display such as color, font, density and screen layout • One screen versus scrolling is better for display
Output options	• Retrieval results presented differently but from Web is generally titles and extract • Different means for getting results: download, print, e-mail or screen display • Usually only gives limited research results but these are ranked
Help facilities	• To help users with frequently asked questions (FAQ) and deal with errors • Give suggestions

The organisation and structure of the web site may either support usability and user confidence and its ability to retrieve information or not. From the user's perspective, the interface is expected to fulfill his/her information need (Danaher McKay & Seeley 2005). Navigation positively or negatively supports the searching and browsing behaviour of the user and may include a search and advanced search capability. Buttons, icons, a site map, search headlines, bookmarks, the menu, etcetera are all aspects of navigation (Garrett 2003; Krug 2000; Lancaster 2003; Nielsen 2003). The user interface will be discussed more fully in Chapter seven.

In summary, the user has been investigated from the perspective of the search process, in particular, search behaviour related to the Web and web sites in order to develop the profile of a particular type of user, namely the health information seeker, which will be discussed below.

3.4 CHARACTERISTICS OF HEALTH INFORMATION SEEKER

The goal of the database-driven web site, as discussed in Chapters six and seven, is to provide health conscious users with access to health information resources for informed wellness and lifestyle choices. According to Fox (2006:1), health seekers are "the Web users who search online for information on health topics, whether they are acting as consumers, caregivers, or e-patients". Health information seekers are not trained in conventional medicine and therefore are lay people having lay knowledge. Access to the Web has increased their body of knowledge about health and their knowledge about their bodies. This has provided them with experience and a level of expertise (Hardey 1999; Henwood *et al* 2003; Hogle 2002). Prior (2003:53) refers to the lay expert that combines the ideas of layman and expert. Expertise has to do with making decisions about health matters.

Users have distinctive characteristics and they should be studied as groups according to common criteria. It is necessary to identify the characteristics of the health information seeker to inform the development of the profile of the WELLNESS health information seeker.

The literature was analysed in order to establish the characteristics of the user as health information seeker.   The following perspectives and relevant researchers were found to be important:

- demographics (Bowen *et al* 2003; Chu 2005:167; Deloitte Consulting and Deloitte & Touche 1999:8; Health on the Net Foundation (HON) 2003b; Huntington, Nicholas, & Williams 2003; Nicholas *et al* 2003)

- valuegraphics (Astin 1998; Kivits 2005:514; Navarro & Wilkins 2001:36, 37; PATH 2002)

- user as health information consumer (Eysenbach 2000:714; Dutta-Bergman 2004c; Hardey 1999; Henwood *et al* 2003; Hogle 2002; Hyman 2005; Lupton 1997:373; Prior 2003:53)

- types of health seekers (Eng 2001; Hirji 2004:458; Horrigan & Rainie 2006; Nettleton *et al* 2004:533)

- patterns of use (Eysenbach & Kohler 2002:574; Zollman & Vickers 1999:837)

- health information literacy (ALA Presidential Committee 1989; National Forum on Information Literacy 2006; Healthy People 2010 2003; MLA 2003; Henwood *et al* 2003; Keselman *et al* 2007; Moritsugu 2007; Norman & Skinner 2006a&b; Sullivan 2000)

- health information seeker search behaviour on the Web (Bates 1989; Bush 1945; Cline & Haynes 2001; Cothey 2002; Crespo 2004; Forkner-Dunn 2003; Fox 2006; Hirji 2004; Kirsch *et al* 2002; Kutner *et al* 2006; Laing, Hogg & Winkelman 2004; McClean & Shaw 2005; McFedries 2002; Motive Resources 2004; Nicholas *et al* 2003; Norman 1993; Poensgen 2001; Powell & Clarke 2002; Preece, Rogers & Sharp 2002; Rogers & Mead 2004)

- goals of health information seeking (Fox 2006; Fuhrman 2003; Hogle 2002; Madle *et al* 2004; Morahan-Martin 2004; Nicholas *et al* 2003)

- information and intervention (Dutta-Bergman 2005; Fox 2006; Godin, Truschell & Singh 2005; Griffiths *et al* 2006*;* Madle *et al* 2004; Morahan-Martin 2004; Nicholas *et al* 2003; Wantland *et al* 2004)

Figure 3.2 illustrates the characteristics of the user as health information seeker that will be discussed. Understanding the health information seeker, as a user group identified by their demographics, has implications for the design of the database-driven web site.
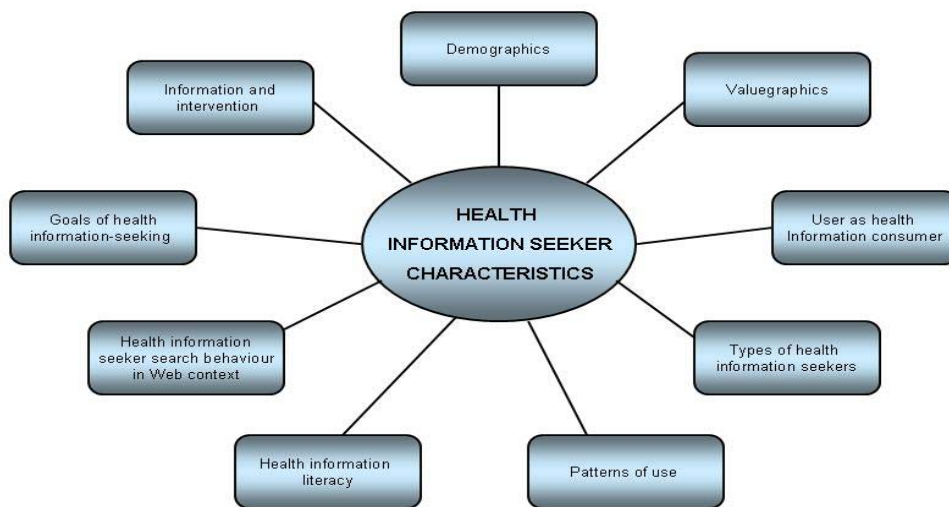
Figure 3.2 Characteristics of health information seeker

3.4.1 Demographics

Demographics refers to the categorisation of groups of users according to gender, age, occupation, economic status, culture, personality and educational background (Chu 2003:167).   Other aspects may be related to birth, death and disease.   Identifying the demographics supports the attempts to know what the needs of a particular user group are.

The most significant contribution to identifying the demographics of the Web users looking for health information has been by the Pew Internet and American Life Project, authored by Susannah Fox. The most recent report (Fox 2006) is from 29 October 2006.   Other authors (Bowen *et al* 2003; Deloitte Consulting and Deloitte & Touche 1999:8; HON 2003b; Huntington, Nicholas, & Williams 2003; Nicholas *et al* 2003) have contributed to defining the demographics of Web health seekers and are included in Table 3.4. The factors used in this study include topics searched, attributes of sites, health sites visited, segmentation of consumers by gender, age, education and employment (Huntington, Nicholas & Williams 2003).

Over the last seven years of polling by the Pew Internet & American Life Project (Fox 2006:1) and surveys done by other research entities (Bansil *et al* 2006), it has been found that using the Web to find health information has remained consistently popular. The percentage of users searching for health information has remained stable over the past four years. This is in spite of the growth of the Web population and broadband connections becoming the norm. This discussion has contributed to an understanding of the demographics of the health information seeker that will inform the WELLNESS health information seeker profile.

Table 3.4 Characteristics of health information seekers – demographics

Perspective	Aspects	Profile
Demographics	Topics searched	• 80% of American Web users (113 million adults have searched for health information) • 7% of total number searched for at least 1 topic on a typical day • 48% said search was for someone else • 36% searched for own health or medical situation • 53% said that the session impacted on how they cared for themselves or for another • 55% said the information found affected their overall approach to maintaining their health or of others • 44% said the information changed their way of thinking about diet, exercise, or stress management Topics related to lifestyle: diet, nutrition, vitamins, exercise, fitness, drugs, alcohol, tobacco usage, sexual health, depression, anxiety • alternative treatments because of serious diagnosis Topic user groups: • alternative remedy • Staying fit and healthy • Keeping up to date • ill but want to know more
	Attributes of sites	• Women favored this more than men • Attitude to site attributes related to user's health interest • Facilities are important • Speed of access • Navigational ease
	Health sites visited	• Site checkers visit many sites • Related to health issues • Related to actions users might take for medication issues
	Segmentation of consumers	Gender: women – care-taking role in family Age: women under age of 65 Youth – are positively oriented to Web and are potential user group receptive to preventive health e.g. fitness, nutrition etc. Education and employment: women are college graduates, full-time employment, higher incomes Web: have online experience and broadband at home • 66% started at a search engine • 27% started at a health related web site • 72% visited 2 or more sites during last session • Men – 42% of users bookmark a useful site. Many are surfers

3.4.2 Valuegraphics

Astin (1998) suggests that users turn to CAM because the ideas seem to be more consistent with their own values, beliefs, philosophical and holistic orientation to health and life. The value the user places on both their personal health and their need for health information influences their health seeking activities. Valuegraphics is a concept that refers to the study of groups according to their preferences, values, behavioural intentions and priorities. The concept has been applied in the health care arena to understand the health information-seeking behaviour of the user as consumer in health care (PATH 2002).

According to PATH (2002), valuegraphics is a measurable pattern of health care values and priorities that influences health thinking and behaviour. These patterns can be used to understand how individuals and groups behave with respect to health care, health products and use health services. Navarro and Wilkins (2001:35) explain the relationship between the value that the user places on the quality of health desired and his/her current level of health involvement. Values, health behavioural intentions and priorities predict the level of information-seeking. Navarro and Wilkins (2001:36, 37) used the PATH (Profiles of Attitudes Towards Health care) model to represent five groups according to their priorities, values and behaviour, namely the generic, ready user, independently healthy, naturalist and family centred groups. Table 3.5 presents the profile of each of these groups.

Table 3.5 Characteristics of health information seekers – valuegraphics

Perspectives	Aspects	Profile
Valuegraphics: values, references, behaviours, priorities	Independently healthy	• Place high value on, motivated and proactive in achieving optimal personal health • Uses Web the most • Slight distrust of medical professions • Will experiment with alternative health care • Not likely to reuse a web site if content is focused on disease, treatments, hospitals, drugs • Value information on wellness, sports medicine, peak performance

Perspectives	Aspects	Profile
	Generic	- Highly price conscious - Want only basics in health care services - Display low concern about personal health - Do not plan ahead for health care - Only seek health care when really need it - Display moderate trust in medical professionals - High information needs when it comes to price - Display high receptivity to health care advertising - Willing to experiment with alternative health care - Display lower demand for health care services - Concerned about health care costs
	Ready user	- Very actively involved in personal health - Plan ahead for health care - Driven by high value placed on above average health - Place high priority on health information-seeking - Receptive to health care advertising - Place high value on high quality care and will pay more - Willing to experiment with alternative health care - Trust medical professionals - High productivity in health care
	Family centred	- Interest in information is for others in the family - Will experiment with alternative health care - Interested in information on wellness for sake of family
	Naturalist	- High value on achieving above good health - Interested in nutrition and physical activity - Avoids traditional medical care - Value seeking health information especially in alternative health

Kivits (2005:514) suggests that health related topics such as healthy eating and fitness are likely to attract those healthy people who value the maintenance of health. Valuegraphics and an understanding of the value placed on health and the various aspects of health, for example diet, exercise and stress management, are factors that impact the health information seeker orientation towards optimal health and wellness. There is a correlation between the beliefs, intentions, priorities, preferences and worldview as discussed in section 2.2.4.4 and 4.3.2, of health information seekers and the value they place on health.

3.4.3 User as health information consumer

In section 2.3.1 the user of health information was described as a consumer, which implies that the user is an active user of health information. The term also embodies the idea of empowerment, motivation, education, health consciousness, self-care and the value placed on being healthy and holding stronger health-oriented beliefs. The search for information about a healthy lifestyle is positively associated with ideas of the importance of change in personal behaviour, as well as change in the environment and social situations (Dutta-Bergman 2004c; Hyman 2005). 'Reflexive consumer' and 'reflexive self' identifies the user as the "self who acts in a calculated way to engage in self-improvement and who is skeptical about expert knowledge" but who requires and needs health information (Lupton 1997:373). Eysenbach (2000:714) suggests that, in the information age, health care system information technology and consumerism work in synergy with each other to identify the user as consumer and support the consumer in accessing information and control of personal health.

Information and the healthy self have become interrelated. The constant flow of information has encouraged empowerment and a sense of responsibility to take care of one's health on a daily basis. It has challenged the monopoly of conventional medicine and also questioned the legitimacy of CAM in this context of professional knowledge and science. It has also impacted on the evolution of the 'informed patient' who is capable of personally assessing the benefits and risks of different treatments (Henwood *et al* 2003; Kivits 2004; Prior 2003). This has resulted in the phenomenon of 'informed choice'. This has particular relevance as informed lifestyle choice is a goal of this study.

The need for information has also impacted on the relationship between practitioners and patients, as well as on the emergence of organisations and institutions involved in the dissemination of quality information. Information is viewed as a product that is required by a consumer as health information seeker. The increased access to vast amounts of information resources has increased personal responsibility about personal health, but has also raised

concerns about the organisation and quality of resources available. Health information literacy is also implicated in this context. The health information seeker seen in this context is a consumer who takes personal responsibility for their own health and wellness and is actively seeking health information to make personal informed lifestyle choices.

3.4.4 Types of health information seekers

This active health information seeker seeking information to make personal informed lifestyle choices can be characterised by his/her form of engagement (e-Types) with the Web. Individuals may occupy various health e-Types during their pathway of health or illness.

Consumer e-Health refers to the shift towards the use of the Web and ICTs seeking to improve or enable health care (Eng 2001; Horrigan & Rainie 2006). Nettleton *et al* (2004:533, 537, 547) discuss health information seeker types in this context and refer to health resources on the Web as e-Health and the ways in which the users engage with the Web as e-Types. The individual user may search the Web using different perspectives and assume different forms of engagement (e-Types) as he/she approaches information and responds to factors such as health need. A bottom-up typology of e-Types is offered to understand the social patterns of this Web use. The domesticated e-Type feels at home and is comfortable and is most probably a regular user. The reluctant user's engagement makes them feel unfamiliar and incompetent. The concept of 'reflexivity' refers to the way in which individuals access the Web for information and make use of the resources to pursue life projects, make lifestyle choices, solve problems, manage risk and engage in life planning. Table 3.6 integrates these concepts and identifies six health e-Types as described by Nettleton *et al* (2004:537).

Table 3.6 Typology of health e-Types as domains of reflexivity

		Relationship with Web		
		Problematic	Resource used episodically	Domesticated
Reflexivity	Instrumental	Reluctant searchers	Purposeful searchers	Surfing searchers
	Affective	Reluctant gatherers	Purposeful gatherers	Surfing gatherers

Table 3.7 lists the consequences of these different types of use, namely informational, reassurance, various emotional responses, results relating to consultation, for treatment and for decision-making, in terms of social action.

Table 3.7 Consequences of using e-Health

Consequences	Affective reflexivity	Instrumental reflexivity
Informational	√	√
Reassured	√	√
Other emotional response	√	√
Consultation		√
Treatment		√
Decision-making		√

The use of the Web is embedded in the approach that people take to seek help, advice and information. It is part of everyday routine and the management of health, illness and those related behaviours. Because the Web is used for specific health needs, information is also embodied in the sense that it does and will make a contribution to people's health needs. Not only have health e-Types been categorised in terms of use of the Web, but there is also reassurance of the fact that the user can expect to engage in reflexive life planning (Nettleton *et al* 2004:551). Hirji (2004:458) concluded that e-Health will affect consumers and empower those that have access to information especially in the context of health management.

3.4.5 Patterns of use

Another characteristic of the health information seeker is their patterns of use of the Web relevant to their level of information need. Zollman and Vickers (1999:837) identified the following patterns of use of the Web to characterise the user:

- earnest seekers have an intractable health problem for which they try many different forms of treatment
- stable users either use one type of therapy for most of their health care or have one main problem for which they use a regular package of one or more CAM therapies
- eclectic users choose and use different forms of therapy depending on individual problems and circumstances
- one-off users discontinue complementary after limited experimentation.

Eysenbach and Kohler (2002:574) conducted an observational study in order to document user behaviour in the context of the actions of the health information seeker. Most of the search queries were single word searches. Boolean operators and phrase searching were used minimally. Most of the participants limited their experience to the first five search results.

3.4.6 Health information literacy

There is a relationship between the user's level of health information literacy and the ability to search, retrieve and understand health information. This is a key ingredient of the understanding of the user and should be taken into consideration in the development of the database-driven web site (chapter 6 & 7), selection criteria (chapter 4) and the thesaurus construction (chapter 5).

Information literacy (ALA Presidential Committee 1989; Kirsch *et al* 2002; National Forum on Information Literacy 2006) consists of the following:

- the ability to know where there is a need for information
- the ability to identify, locate, evaluate information to meet the need effectively
- the ability to use information for problem-solving, to function in society, to achieve one's goals
- use of information so others can learn
- a set of skills needed to find, access, retrieve, analyse information
- knowing how to learn and how knowledge is organised
- development of one's knowledge and potential

Moritsugu (2007), acting U.S. Surgeon General, observed that nine out of ten Americans are health illiterate and therefore lack the skills needed to take care of their personal health. People with low health literacy are:

- less likely to know how to navigate the health care system
- less likely to understand basic health information
- less likely to get preventive health care services
- more likely to use expensive emergency care services.

Health literacy (Healthy People 2010 2003; Henwood *et al* 2003; Keselman *et al* 2007; Kutner *et al* 2006; MLA 2003; Moritsugu 2007; Norman & Skinner 2006a&b; Sullivan 2000) has been identified as a public health goal for the 21st century and a significant challenge facing health care globally. It has been described as follows:

- the ability to recognise a health information need
- the ability to identify likely information sources and use them to retrieve relevant information
- to assess the quality and validity of health information
- to evaluate the applicability of information to a specific situation
- the ability to read, understand and act on health care information
- the ability to obtain, process and understand health information to make good and appropriate health decisions

- the capacity to interpret basic health information and services
- the competence to use health information to enhance health
- health care experience and motivation
- the skills needed to be health literate and make informed choices about health care
- the skill of evaluation in order to be a critical consumer
- the ability to access sources of information on the Web in terms of searching and information retrieval.

In the context of this study, it is also important to define e-Health literacy. It is defined as the ability to seek, find, understand and appraise health information from electronic sources and apply the knowledge gained to addressing or solving a health problem (Norman & Skinner 2006a). It aims to empower individuals and enable them to fully participate in health decisions informed by e-Health resources. There are six core skills (or literacies) for e-Health: traditional literacy, health literacy, information literacy, scientific literacy, media literacy and computer literacy (Norman & Skinner 2006a).

According to Feather (2006:8), one cannot assume, living in an information age, that the level of health literacy is high and the same for everyone. Living in an information society requires active participation and the ability to seek and find information and use it. The lack of health literacy skills emphasises the need for information to be provided at a level that can be understood by the user, as well as in a user-friendly format. The information professional brings critical knowledge and skills to make the health information seeker aware of the range of information resources available, to help users refine questions for effective searches and to make the best use of time and resources. This has implications for the design and the need for a web site that will provide access in such a way that those who lack skills will benefit.

The process of making health choices and decisions includes an understanding of the information need, selection of sources, search and retrieval, appraisal of quality and relevance, analysis and understanding, and

application to problem. Understanding and accommodating various levels of health information literacy should be taken into account in the design of the prototype database-driven web site.

3.4.7 Web information searching behaviour

The health information seeker is also characterised by his/her search behaviour in the context of the Web. It is important to identify the reasons given for the use of the Web for accessing health information, as these reasons have implications for the development of the database-driven WELLNESS web site.

It was established in section 2.2.2 that there is an increase in the number of health seekers who use the Web to satisfy various health information needs. It is important for this study to understand search and retrieval on the Web in the context of health information seeker search behaviour, as ease of access to WELLNESS health information resources is the goal of the design of the database-driven web site.

The literature was researched and analysed (Bates 1989; Bush 1945; Cline & Haynes 2001; Cothey 2002; Crespo 2004; Forkner-Dunn 2003; Fox 2006; Hirji 2004; Laing, Hogg & Winkelman 2004; McClean & Shaw 2005; McFedries 2002; Motive Resources s.v. 'information foraging' 2004; Nicholas *et al* 2003; Norman 1993; Poensgen 2001; Powell & Clarke 2002; Preece, Rogers & Sharp 2002; Rogers & Mead 2004) to understand Web-based user search behaviour. Table 3.8 highlights the factors involved in Web-based user search behaviour.

Table 3.8 Web-based user search behaviour

Factors	Explanation
Levels of involvement	Passive, active and highly involved users reflect degrees of involvement in search. Highly involved will have searched for information and developed a personal opinion.
Levels of health	Groups according to levels of health are; the 'well', 'newly diagnosed', 'chronically ill and caregivers'. The well group does episodic searching on short-term medical conditions, pregnancy and prevention issues. Newly diagnosed does intensive searching for specific information and thus value ease of access and broad range of information. Chronically ill and caregivers search regularly for new treatments, nutrition advice and alternative therapies. They value chat room and online communities.
Ways of accessing	Online health information is accessed in these ways: • Searching directly by typing in a particular URL • Participating in support groups and discussion boards • Consulting with health professionals in chat sessions or via e-mail • Typing a keyword in a search engine.
Conceptual structure	This functions as cognitive scaffolding to help establish associations (links) by organising, providing shape and substance in the web site.
Information foraging (Motive Resources 2004)	Strategies used when seeking information and ways in which the seeker adapts during the activity. The interface is important as the information seeker uses a cost-benefit approach to the web site. This includes experience in searching for information.
User expertise and experience	The information-seeking behaviour of the novice differs from the expert. Expert infers experience.
Searching and browsing – user activities related to the Web as medium for distributing information	Searching is an analytical activity and requires recall of query terms, reformulations, assessment of results. Browsing is passive and depends on recognising relevant information.
Range of web sites	Different user types might be attracted to different kinds of health sites according to site attributes and content differences. Users find some sites easier to digest than other and jumping from site to site facilitates comparison and contrast of information. This could be design factors.
e-Types	Health online consumers do not behave as typical online consumers. If considered as mere consumers, relevant health information would be in the context of advertising and products rather than as information to make informed lifestyle choices.

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Two determinants of user search behaviour are the push pull approaches to search and retrieval on the Web (Harrison 2005:61). Information that is pushed to the user is assumed to be filtered so that it is of interest to the user and the user will wish to view most items. Information that is pulled comes from large data sets and only a small fraction of the data, which is identified by the user as of definite interest, is retrieved for viewing. The pull approach is where resources are available for users to search or browse and the user should take specific action (for example, click a link) to retrieve an information resource. Push systems tend to require less work from users because they replace the necessity to search for information explicitly. Their effectiveness is dependent on the ability of the system to select relevant content for its users, which can be difficult in settings where users vary in interests, needs and goals (Harrison 2005:61).

3.4.8 Goals of health information seeking behaviour

The goals of user health information-seeking reflect their expectations with respect to information need and system requirements. The goals of the health seeker (Fox 2006; Fuhrman 2003; Hogle 2002; Madle *et al* 2004; Morahan-Martin 2004; Nicholas *et al* 2003) are the following:

- find reference information on a particular topic
- monitor a particular topic or related topics over time
- answer particular questions
- become members of a community that can provide ongoing information and support
- search for magic cures, supplements, pills, diet plans
- information to make informed choices about health and wellness
- information for making decisions
- fulfill an information need
- return to a web site in order to satisfy a query that the particular web site is expected to fulfill
- intervention and change

- restoration of health

- maintain health

- seek optimal health in terms of wellness

- understand illness or injury

- find information on which to act in order to improve health

- think about lifestyle and health behaviour

- identify important lifestyle factors

- learn more about reducing risk

- give up smoking

- knowing what to eat and change eating habits

- go for regular health checkups

- take vitamins and supplements

- get a second opinion

- know how to deal with stress.

The goals listed above reflect the various reasons why the health information seeker engages in information behaviour. Health information seekers' information behaviour consists of activities they engage in when identifying their own needs for information, then searching for this information in any way and using or transferring that information (Wilson 1999). Essentially, these goals can be translated into information needs and the solving of problems. Individuals who use online health-related information resources have a variety of goals which they expect can be met reasonably effectively by current technology, in particular by the Web as a general information resource. Their information-seeking behaviour is a consequence of a perceived need. In order to satisfy that need, they make demands on formal or informal information sources or services which results in success or failure to find relevant information.

3.4.9 Information and intervention

Integral to the goals of the health information seeker is access to information for change and intervention. It is becoming apparent that the accessibility of

information on the Web has the potential for increasing knowledge, supporting health behaviour, change of attitude and change of lifestyle (Dutta-Bergman 2005; Fox 2006; Godin, Truschell & Singh 2005; Griffiths *et al* 2006*;* Madle *et al* 2004; Morahan-Martin 2004; Nicholas *et al* 2003; Wantland *et al* 2004). The components of interventions available on many Web sites include information, advice, peer group support, one-to-one contact, blogs, online groups, wikis, BitTorrent and more. Potts (2006) stated that if resources on health-related lifestyle issues such as nutrition, fitness, sex, relationships and parenthood are provided, the number of users of this information increases (Potts 2006).

The emphasis in a self-care context, as evidenced in Chapter two in the emergence of a new worldview, is to encourage informed choice, intervention and behaviour change. An understanding of how health seeking information activities affect behaviour, as well as how access to resources available on the Web can influence and affect behaviour, is required. Research has evidenced that Web-based interventions have resulted in increased exercise time, increased knowledge of particular treatments, nutritional status, increased participation in health care and improved weight (Wantland *et al* 2004:e40). Fox (2006:8) reports in the most recent Pew Internet and American Life Project survey as follows:

- 53% of health seekers said that the session impacted on how they cared for themselves or for another
- 55% said the information found affected their overall approach to maintaining their health or someone else's
- 44% said the information changed their way of thinking about diet, exercise or stress management.

Madle *et al* (2004:24) found in their study that there was a relationship between the user's belief that they had learned from using a site and actual change as stated in "I have learned something new after using this site" which reflects a change of attitude, increase in knowledge, change in behaviour, that is, intervention took place. Web-based intervention and prevention

programmes can make a significant contribution towards realising wellness on a personal and societal level. The possibility of risk of harm associated with using the Web as a health information resource was found to be low (Bansil *et al* 2006:2). The potential of developing a web site interfaced with health behaviour strategies for change with respect to intervention is an important goal of this study. Potts (2006) predicts that "there will be demand for a huge variety of Web-based interventions tailored in all sorts of ways, just as people generally want personalised health information".

Sections 3.2 and 3.3 researched the general user information need and user information behaviour from an information science perspective. Section 3.4 researched the user as health information seeker, that is, a user searching for health information, particularly on the Web. In section 3.5, the profile of a specific group of health information seekers, namely the WELLNESS health information seeker, will be developed. The WELLNESS health information seeker is the specific user group for which the prototype database-driven web site was developed. The implications for design should be identified as the goal of this chapter is to profile the user in order for the design process to be user-centred.

3.5 WELLNESS HEALTH INFORMATION SEEKER PROFILE

The specific user of the web site is identified as the WELLNESS health information seeker. As discussed in sections 2.2.4 and 4.2, the database-driven web site was developed from the WELLNESS approach. A profile of the user as WELLNESS health information seeker is presented in Table 3.9.

The development of the profile of the WELLNESS health information seeker considered the following aspects of the user:

- various levels of understanding of the user
- demographics and valuegraphics
- user search behaviour

- user and the Web and problems with Web as information retrieval system

- user search process

- ability to request required knowledge in terms of questions or specific requests in the form of commands

- dynamic processes of moving the user towards sense making

- user sense of relevance of the information to their problem and information need

- concern about public access to information and vulnerability of the user in the provision of information

- the role of the user as health information seeker

- user and system interface

- the contexts of the user such as that of communicator, information seeker, user of formal information systems, recipient of information services and as a user of information (Kulthau 1991; Wilson 2000; Ziebland *et al* 2004).

All of the aspects of the user and the system translate into different information needs and information-seeking behaviours and search processes. The user information need is a significant aspect of understanding the user for the purpose of designing a user-centred, database-driven web site of health information resources to facilitate informed lifestyle choice. The physiological, emotional and cognitive needs of the user will contribute to the search or information-seeking behaviour with the intention that information-seeking is the satisfaction of information needs. If personal needs are the reason for motivation towards information-seeking behaviour, then these needs are probably related to the roles of the individual in social life.

The questions developed in the user model in the original study (Steyn 1999:91) and set out in Annexure one, together with the literature review in this chapter, were used to develop the profile of the specific group of health information seeker, namely the WELLNESS health information seeker, and identify the implications for design. The user model identified the following

seven questions to ask when profiling the user: who? (who is the user); what? (what is the user looking for); how? (how do they search for information); why? (why are they looking for information); format? (what format do they want the information in); and what for? (how will they use the information).

The term 'user' is used here to represent the WELLNESS health information seeker. Table 3.9 will schematically present the profile.

Table 3.9 WELLNESS health information seeker profile

Attributes	User Profile	Implications for Design
Who? • Audience • Decision-making, problem-solving • Time • Computer/ technology literacy • Demographics, psychographics • Health literacy • Linguistic level • Searching behaviour • Personal or care for others • Task • Types	• Health conscious seeking wellness resources to make decisions and solve problems • Has physical, emotional, affective and spiritual needs, a wholistic view, and requires balance • Assumed personal responsibility for health • Users reflect a CAM worldview of health with emphasis on prevention, empowerment and importance of lifestyle factors such as nutrition, diet, stress management, exercise • Require credible, current and proven information • Health seeking is purposeful, related to health level and need for self and others • Values optimal health, disease prevention and HP • Use of Web as source. Ubiquitousness, 24/7 availability, anonymity, privacy and confidentiality are valued • Power-users use Web information for every-day life including health • Active and not merely a passive patient. Some are dissatisfied with practitioners but not all • Different levels of skills in using the Web.	• Development of a conceptual schema based on user needs and requirements • WELLNESS web site • WELLNESS information divided into specific lifestyle factors (e.g. water, exercise, etc.) • Accurate, relevant, quality, reliable information • Navigation to make connections between content elements • WELLNESS homepage defines intended audience • About page clarifies authority, credibility, mission and goals • Validity – evidence to establish trust and credibility • Links to other relevant sites to support users evaluation and

Attributes	User Profile	Implications for Design
	Novice and expert users. Users may be regular and domesticated, or unfamiliar and reluctant • Different ISP skills. Seekers and gatherers • Different levels of health information literacy • Specifically women users interested in topics related to lifestyle • Youth users potential target as most receptive to preventive health care • Less and less newcomers mean that a niche audience is needed • Message should be clear and understandable and efforts made to improve literacy • Task requires combination of searching and browsing	discernment processes
What? • Problems • User information need • Scope of information • Searches expected • Suitable system • Purpose • Interface • Interaction design • Usability	• Health questions that need answers • Finding information is a constructive activity to find meaning, extend state of knowledge, to make choices, change habits and for personal sense making • Information need is to seek lifestyle information for optimal health • Diversity of users means diversity of resources but information should be focused and organised • User is in partnership with health provider and roles are changing from passive patient to informed consumer and choices are made in partnership • User as reflexive consumer has need for targeted information. The need is to access the health care system to find best practices, initiatives and assess risk • Intervention is believed to be more than focus on symptoms	• Supports querying • Search functionality • Information content on lifestyle factors • Resources in a variety of formats • Organisation of content by lifestyle factors • Disclaimer emphasising partnership with health provider • Facts, statistics, sharing knowledge of success (reversal of chronic disease by means of lifestyle factors) • Update regularly and

Attributes	User Profile	Implications for Design
	• User searching behaviour varies from foraging, surfing, seeking, searching, browsing and gathering. Only the first few links are explored. Different activities reflect different perspectives • User expects organisation, links and structure to support activities • Mental models support ways to present right kind of information level so that user can proceed • Media type is not important but should be identified as an entity	maintain currency • Encourage behaviour change by means of usability • Use of links to other resources (e.g. body mass index (BMI) calculators, food pyramid) • Navigation accommodates different levels of experience and expertise • Use standard conventions • Design should support both browse and search activities • E-R model used in design • Accurate, up-to-date information • Establishment and publication of selection criteria
How? • Interaction, interface • User requirements	• Users emulate real world experience and conventions help experienced user to cope • There are novices, newbies, power-users, experienced, experts, professionals, academics, information professionals • Patterns and relationships between concepts need to be reflected in structure • User needs tools for self-care and for others	• Develop wire frame • Interface accommodates novice to expert users • Interface is structured • Continuity between pages • Use of familiar navigation buttons, menus, tabs

Attributes	User Profile	Implications for Design
Where? • Resources • Sources • Interface • Effectiveness • Efficiency • To accomplish tasks • Accessibility • Availability	• Centralised collection of resources reflecting a particular approach • Web is place users go for specific health needs • Web is information source that is frequently used for health information • User needs subject areas and categories as reflected in structure and navigation of interface • User requires accessibility and availability of resources so Web is the resource chosen • Users may have problems expressing questions as commands or formal statements • User queries are actually an unexpressed, subconscious need for information • Academic or library web sites are not used as much as search engines, e.g. Google, etcetera	• External design (web site) posted on Web • Internal design mapped onto established entity for hosting of database, backup, recovery • Match characteristics and constraints of conceptual model to an appropriate host
Why? • System to do more • System to do better • System to do faster • Information needed • Content to do tasks • User need is often not clearly defined • User problems differ	• User expects that the system will provide information in a smooth, effective, organised and efficient way • The interaction design between the machine and user should reflect credibility as information is perceived as complete • Users do not want to be interrupted by the interface • System needs to respond to the queries even if the lack of ability to express the need in a query or formal statement • Specificity • Simple presentation and instructions • Ease of use and speedy • Easy location and retrieval • Terms suitable for novice and expert	• Provide feedback when errors made • Choice of platform in internal design that will provide smooth, fast, effective searching and return of results • Completeness so that information retrieved and task accomplished • Learnability – ease of use to accomplish basic tasks • Memorability – remember how to use after a period of time • Safety – minimising

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Attributes	User Profile	Implications for Design
	• Clear options on the screen • Rules and guidelines • Indexing and subject vocabulary control • Use of specific access points, e.g. author and authority control • Scope determined by selection criteria	hostility, frustration, making errors • Utility – allowing the user to do what they want to do • Usability – user interface supports tasks
Format? • Entities in convenient format • Achieve goals • Interactive system • Doesn't interfere with task	• Some users may lack searching skills • The ISP of the user needs to be compared and matched so that the interaction with the system can be reflected and behaviour predicted • Familiarity with labels and concepts • Prior knowledge of a system and habits of use are important	• Labels and concepts used should enhance searching behaviour. • Keywords • Thesaurus • Relationships shown between categories of WELLNESS as well as entities • Variety of entities to fulfill tasks • System needs to facilitate searching. • Professional and credible are integral to the format requirements • Conventions support information-seeking • Usability • Ease of use • Feedback mechanisms • Submit feature • Visually appealing design • Link on every page to homepage • Information architecture

Attributes	User Profile	Implications for Design
		considered
What for? • Tasks • Complete safely, effectively • Pleasure, enjoyment • Relevant, specific current • Queries, answers • Informed lifestyle • To make choices • To make changes • Wellness of self and others	• Resources provided by the system should be useful to solve problems and answer queries. • Healthy people need information for sense-making, to make changes, for improvement, for maintenance of health and to manage risks. • Lifestyle is a matter of choice and the user has rights to make personal choices for self-care. • Users need information for empowerment and decision-making. • Values embedded come from the user need and requirements. • Users are reflexive in life planning. • Internet and WWW are believed to contribute to informed choice. • Users are rational actors, self-helpers and need information. • User as lay user may be expert with reference to information that has been retrieved. • Expert knowledge does not only reside in medical knowledge of practitioner. • User experience should be pleasurable, productive, informative and satisfactory.	• Usability • Interface design • System should deliver complete information • Relevant, specific, current, up-to-date information • System should answer questions and solve problems • System should support ISP

3.6 CONCLUSION

User-centred design requires that what is known about the user information need and user information behaviour be applied practically in the design of the database-driven web site in Chapters six and seven. This chapter researched the user, their information need, information-seeking and search behaviour to inform the design process to ensure that it is user-centred. Within the context of the current health care situation, the information need and search behaviour of the health information seeker as a user group were

researched and discussed to provide a background to the development of the specific user group profile, namely WELLNESS health information seeker. This specific group of health information seekers requires WELLNESS health information for personal informed lifestyle choice. The WELLNESS health information seeker profile provided significant information that answered the basic questions of who? what? where? why? how? in what format? and for what purpose? These factors, detailed in Table 3.9, have implications for the design process and will be discussed in section 7.2.

In Chapter four, the WELLNESS approach will provide a framework for the development of a five-dimensional model of selection criteria, as well as criteria for selecting quality information content for the WELLNESS web site.

CHAPTER FOUR

WELLNESS HEALTH INFORMATION RESOURCES: CRITERIA FOR SELECTION

4.1 INTRODUCTION

This chapter focuses on the 'resources', those information sources which together constitute the WELLNESS health information resources, and the criteria for their selection. Chapter three focused on the 'user' and established the profile of the WELLNESS health information seeker who requires WELLNESS health information resources. Chapters' five, six and seven will focus on the 'tool', namely the thesaurus, database and web site, which will organise and provide access to these WELLNESS health information resources.

It was evidenced in Chapters two and three that the Web is widely used by health information seekers to access health information and that it provides an infrastructure for the development of a WELLNESS web site. The nature of the Web as search and retrieval mechanism for relevant, quality, credible and scientifically based or proven health information was discussed in section 3.3.2. The problems related to the Web evidenced the need for specific WELLNESS resource selection criteria. These criteria will be used in the evaluation and selection of WELLNESS health information sources and resources for the WELLNESS web site to satisfy the user requirement for quality, credible and scientifically based or proven resources as stated in Chapter three, Table 3.9 and in Annexure one, a summary of the original research. The aim of this chapter is therefore to identify these criteria for the selection of relevant, reliable and credible WELLNESS health information resources as formulated in a five-dimensional model.

Wellness was defined and discussed in section 2.2.4 and the use of the acronym WELLNESS introduced to identify a specific approach to wellness.

In this chapter a WELLNESS resource framework will be outlined for the purpose of the identification, selection and organisation of appropriate resources that meet the selection criteria established to form the content of the WELLNESS web site.

The WELLNESS framework will provide a specific focus for both the information provider and the WELLNESS health information seeker hereby delineating the information resources to be selected. It is important to identify a specific approach to wellness that has a research base, is legitimised by science and meets the criteria identified in the user profile in Table 3.9.

4.2 FRAMEWORK FOR COLLECTION OF WELLNESS RESOURCES

With the onus of responsibility resting increasingly on the health information seeker for making informed lifestyle choices, resources should be carefully selected to facilitate personal decision-making and behaviour change. Additionally both the information provider and health information seeker need discernment and awareness of the medical systems and their practice to make informed choices.

A framework which defines wellness and its components should be identified. Wellness was defined and discussed in Chapter two, section 2.2.4 and the use of the acronym WELLNESS introduced to identify a specific approach to optimal health, that is wellness. The specific framework for WELLNESS is the approach to wellness advocated in the worldview and practice of the Seventh-day Adventist (SDA) church. It is a lifestyle adopted and practiced by a large majority of its members worldwide. Ongoing research on SDA health and lifestyle has brought visibility and accolades to the lifestyle recommended by SDAs from both the scientific and lay communities. The researcher has identified that the research (numbering more than 250 reports) from 1958-2007 (for example Beeson *et al* 1989; Buettner 2005; Dysinger 1997; Fnneb 1994; Fraser 1994; Fraser 2003; Fraser *et al* 1991,1992; Fraser & Shavlik 1997; Giem, Beeson & Fraser 1993; Kuzma & Lindsted 1990; Loma Linda University 2007; Nieman 1992; Ornish 1990; Resnicow *et al* 1991; Singh &

Fraser 1998) on the SDA health and lifestyle, has shown that a lifestyle orientation based on eight principles of health and wellness, namely water, exercise, life in proper balance, loving relationships, nutrition, enjoying rest and relaxation, sunlight and fresh air, and stress management results in longevity, less illness, reduced risk of chronic disease and promotes vibrant health.

The studies mentioned above have been among the first to raise scientific awareness of the close relationship between diet and health. Ornish (1990:1), in reference to the six-year Adventist Health Study number 1 (AHS-1) in which 24000 vegetarian Californian SDAs were researched, comments on the fact that American SDAs are one large group of Americans who have maintained a vegetarian diet and who have experienced less mortality rate from coronary heart disease (72% less) than the general population in the same age group.

Data is currently being collected for the latest long-term research project Adventist Health Study number 2 (AHS-2) exploring the links between lifestyle, diet and disease among more than 100 000 SDAs in the U.S. and Canada. AHS-2 is funded by the U.S. National Cancer Institute (NCI) and is being conducted by researchers at the Loma Linda University School of Public Health in partnership with Oakwood College (Loma Linda University 2007).

A large number of hospitals, training facilities and lifestyle centres are located around the world that embody these eight principles of health and wellness, as outlined by White (1942:127,128), and advocate a healthy lifestyle. These eight principles are as follows:

> Pure air, sunlight, abstemiousness, rest, exercise, proper diet, the use of water, trust in divine power, - these are the true remedies. … Too little attention is given to the preservation of health. It is far better to prevent disease than to know how to treat it when contracted. …Health does not depend on chance. It is a result of obedience to law.

Various acronyms such as START-A-NEW (sunshine, temperance, air, rest, trust in God and nutrition, exercise, water), NEWSTART (nutrition, exercise,

water, sunlight, temperance, air, rest, trust in divine power), STEPFAST (sunshine, temperance, exercise, proper diet, fabulous water, air, pure and fresh, sleep, trust in God) and CHIP (coronary health improvement programme) are used to identify these principles and specific approaches of various lifestyle programmes that use these eight principles holistically. The acronym WELLNESS, which is attributed to Craig (2005b:3), has been chosen for this study and incorporates the eight principles as follows:

- **W**ater
- **E**xercise
- **L**ife in proper balance
- **L**oving relationships
- **N**utrition of a good quality and proper quantity
- **E**njoyment of adequate rest
- **S**unlight and fresh air
- **S**tress management

Information sources and resources on these eight principles of WELLNESS and related topics will form the structure and content of the WELLNESS web site. WELLNESS resources, delimited by the WELLNESS approach, and selected according to the five-dimensional model of selection criteria as outlined in section 4.3, Figure 4.1, will be recommended in Chapter eight for inclusion in the WELLNESS database and made available on the WELLNESS web site.

Calabretta (2000:7), in a discussion of the use of the Web, quotes Alan Rees, a consumer health information expert, as saying:

> the information needs of consumers have become more complex resulting from the momentous changes in the health care delivery system….Choice is highly valued in the selections of options….Choice is, however, relatively meaningless without accurate and reliable information.

The issue of relevant, quality and credible information for making informed lifestyle choices is a critical one that should be addressed in the development of the database-driven web site of health information resources to support the WELLNESS approach. The concept of 'selection' requires decision-making from both the information provider and the health information seeker. 'Criteria' infers that both the information provider and health information seeker will be able to select WELLNESS information resources. The development of a model for selection criteria will provide criteria to be used for selection.

4.3 DEVELOPMENT OF A MODEL FOR SELECTION CRITERIA

A number of problems, summarised below, were raised in earlier chapters that indicated the need for the development of a model for selection criteria:

- the proliferation of information on the Web
- the nature of the Web as search and retrieval system
- the various worldviews inherent in and evidenced in the history of the different medical systems
- the current health care situation and the emergence of a new worldview
- the scientific validity of various practices and therapies
- the importance of a holistic and systematic approach to wellness, specifically WELLNESS
- the importance of discernment of the health information seeker

The increase in the use of CAM, its challenge to conventional medicine and the question of its credibility, discussed in Chapter two, has been impacted both positively and negatively by the proliferation of information on the Web. One of the outcomes of the challenge of CAM to conventional medicine is the importance of health information and its quality and credibility. Credibility has automatically been attributed to conventional medicine because of its assumed scientific basis. One of the user requirements established in

Chapter three, Table 3.9 and in previous research as stated in Annexure one, was for relevant, quality, credible and scientifically proven resources. This necessitated understanding the advantages and disadvantages of Web search and retrieval and ensuring that a mechanism, namely selection criteria, is in place to meet this user requirement.

The use of selection criteria will determine inclusion or exclusion of resources for the WELLNESS web site. It will also provide the WELLNESS health information seeker with a means to determine whether resources found meet their stated criteria. It has been established that the online health information seeker is often not too concerned about the quality of information found (Fox 2006:1; Fox & Rainie 2003:3&16; Nicholas *et al* 2003:261-262,264; Princeton Survey Research Associates 2000). Fox (2006:9,11) remarks that 85 million (three quarters of the total number) health seekers do not check the source and date of the health information they find online nor do they assess the quality indicators of the information found. 74% of health seekers stated that they were reassured that they could make appropriate decisions about health care based on what they found online. These factors highlight the necessity of the identification, establishment and publication of selection criteria. This will support the WELLNESS health information seeker in his/her WELLNESS health information-seeking activities.

Table 3.9 profiled the WELLNESS health information seeker and his/her need for:

- credible information
- scientifically proven information
- current information
- targeted information
- WELLNESS information sources and resources
- information to make decisions and solve problems
- balanced and wholistic view of WELLNESS
- use of Web as source of information

- information for different tasks and functions
- resources which should be made available and accessible.

It is important to assume that the WELLNESS health information seeker is rational, a critical consumer and expects that the information provider of a database of resources will have used criteria for selecting information that is credible, relevant, current and reflects the goals of the web site. Additionally, the selection criteria should be made available so that the user can critically examine the resources found. Links to web sites that support the user as critical consumer or provide information on quality health information web sites should be included, for example Medline Plus's page (http://www.nlm.nih.gov/medlineplus/evaluatinghealthinformation.html) (NLM 2003b).

For both the information provider and the WELLNESS health information seeker to be able to evaluate information sources and resources, a method of evaluation needs to be developed. Anderson and Jacobson (2003) offer a model that corresponds with the framework chosen for this study. They use five grids of history, faith, science, spiritual discernment and wholism to examine various medical philosophies and practices. Conventional medicine and CAM represent various approaches in the medical and health systems for making informed choices about the origin, authority and authorship of information. Figure 4.1 is an adaptation of Anderson and Jacobson's model (2003) and is the model of selection criteria used in this study. The five dimensions are: science, worldview, history, wholism and discernment. These are important for making decisions about medical/health systems to be considered in the selection of resources.
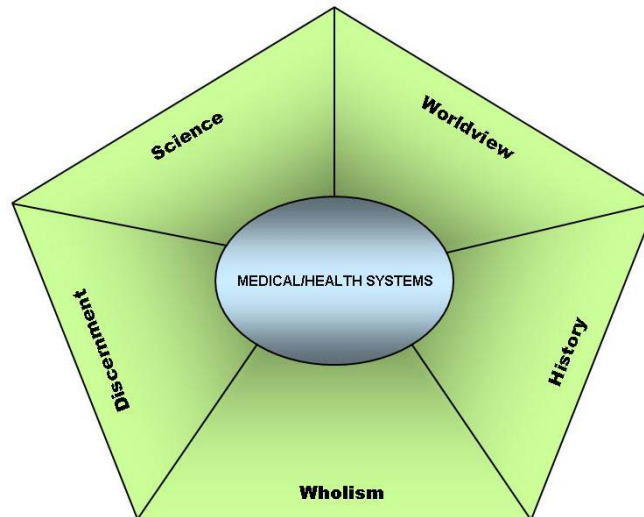
Figure 4.1 Five-dimensional model of selection criteria

These dimensions serve as selection criteria to be used by the WELLNESS health information seeker which will allow him/her as a discerning individual to determine whether the source or resource found on the WELLNESS web site or elsewhere is appropriate and fits with their worldview. By examining each resource according to these five criteria, the information provider will be able to make decisions about the inclusion or exclusion of resources for the WELLNESS web site.

The current epistemic debate arising out of the challenge precipitated by the increased interest in CAM (Dossey 2004:86; Eisenberg *et al* 1993:246-252; Hess 2004:695,697,698; Hirschkorn 2006:533; Kirschstein 2007; Milan *et al* 1998:562; NCCAM 2006) and the response by medical mainstream thinking raises issues that are greater than merely which therapy and practice is most useful and effective. Hess (2004:695) suggests that this requires a continuous integration of the sociology of science and medical sociology. The questions that have to be asked are as follows:

* what is health?
* is health a state of body or of mind or is it a component or attribute of a life of quality?

- what is meant by quality of life and how do these factors impact on the selection of sources for this database?
- who will use it?
- why?
- how?

The answers to these questions will reflect a particular worldview. The five-dimensional model outlined in Figure 4.1 incorporates the issues of worldview of a health/medical system, the role of science, the origin of various therapies, and the importance of recognising the role of the user as reflexive consumer seeking health information in the information age which is characterised by the need for information for self-care and personal responsibility. Discernment encapsulates the idea of empowerment, decision-making and the ability to make informed lifestyle choices.

4.3.1 Science

A discussion of 'science' as one dimension of the model for selection criteria should deal with the debate of whether the various practices and modalities of CAM will stand up to the test of science that is claimed to be the basis for the legitimacy and authority of conventional medicine (Morreim 2003:222). This debate has implications for the information provider, whom the user expects will select resources that are credible and scientifically proven.

It is important to discuss what the concept 'science' infers as well as its relationship to conventional medicine and CAM and how it impacts on the relationship between them. An analysis of the literature (Anderson & Jacobson 2003:73,74; Dictionary by LaborLawTalk 2005, s.v. 'science'; Frohock 2002:215; Hess 2004:701; Hyman 2004b:1; Morreim 2003:222; O'Mathuna & Larimore 2001:143) has highlighted the following relevant aspects:

- science is the systematic observation of natural phenomena in order to discover the laws that govern these phenomena. This also refers to the laws of biology, anatomy and physiology which have implications for health

- science is both a systematic process of gaining knowledge and the organised body of knowledge gained by this process. The underlying assumption is that knowledge gained validates practice, as well as the reliability and credibility of information

- the scientific method or empiricism consists of specific steps that are integral to the process of validation and the importance of objectivity and experimentation

- cognitive rationality is the basis for objective scientific evaluation which leads to a monopoly by ideological rationalization. It normalises science and precipitates social closure. This has led to 'paternalistic progressivism' in which the purity of scientific medical knowledge has been emphasised and the idea of expert knowledge originated and is advanced. This serves to maintain a certain level of abstraction and academic formality while simultaneously causing a distance between client and profession through a process of mystification

- understanding the laws of physiology and bodily function and processes is basic to dealing rationally and intelligently with health and healing. A lack of understanding of the laws of physical health, as well as willful neglect of these natural laws in a lifestyle that is inconsistent with these should result in the consequences of the violation of these laws, namely disease or dis-ease

- scientists use the gold standard to ensure quality in their research which includes: size and design of the study affects reliability; placebo control; randomisation; blind studies; length of the study; identification of possible side effects and risks

- criteria for regularising conventional medicine practices and for identifying irregular practices are drawn from the natural sciences

- the most important characteristic of conventional medicine is its scientific roots

- the successes of medicine have entrenched the dominance of science and empiricism. Scientific theories became the authority and research is the way to develop credible and reliable knowledge
- bio-medicine or the scientific paradigm of conventional medicine values the principles of objectivity, positivism, rationality and universality as well as value-freedom.

The uneasy relationship of CAM and conventional medicine can be traced to the formation of medicine as a profession based on science. Science is used to justify the medical profession and to challenge CAM. CAM is seeking to professionalise, while conventional medicine is trying to maintain its exclusivity in the domain of professional practice (Frohock 2002:215; Hirschkorn 2006:534; Morreim 2003:223,227).

CAM therapies are rated according to their lack of benefit or efficacy of the therapy. CAM therapies may not have been well-studied. There are limitations in the gold standard of research, namely double-blind, randomised, placebo-controlled study, when it comes to testing lifestyle and nutritional interventions (Geller & Francomano 2005:345; Hyman 2004b:18; O'Mathuna & Larimore 2001:136,137; Morreim 2003:223,227). CAM modalities are argued to be unscientific, risky, harmful, prone to create false hopes and a waste of money on unproven methods. Conventional medicine carries risks from side effects, complications, errors, toxins, overuse, abuse and under use of medications (Morreim 2003:227). It is also responsible for raising false hopes, wasting money, using unproven therapies and surgical techniques. There are problems in conventional medicine where the resources of science are not sufficient to study every human mental and physical function and to connect theoretical foundations to practical application. There are documented cases of practices that are not studied before use, of poor methodology, conflict of interest and clinical unreliability.

The problems with scientific inadequacy will be experienced if both CAM and conventional medicine are to be held to the standards of scientific testing

(Morreim 2003:222). It is not just a matter of what works in CAM, but what works in medicine and healing as a whole. The goal is to find the most effective and cost-effective application to prevention, HP and treatment of illness, regardless of the origin of the modalities. The evidence should be made available for the user to make informed choices (Eisenberg 2005; Morreim 2003:222; Shine 2001:s145). Pauling, as quoted by Hyman (2004a:11), explains that although medicine is largely based on the sciences, it has not yet become a science and what is needed is a unifying theory on health and disease. The reason given is that it does not emphasise advice on lifestyle factors such as diet, nutrition, supplements and its importance in the prevention of chronic disease.

Ironically, questions about the credibility of science have made way for CAM to gain popularity which in turn has influenced the 'scientific' dogmatic attitude of conventional medicine and made it more difficult for the health information seeker to know what is true and reliable. Morriem (2003:225) suggests that the more scientific a study is, the less it will actually apply to ordinary people. There is a disconnect between science as the study of the general and clinical medicine as the study of the particular. The very method that science uses to test its own validity and credibility has betrayed it with the consequence that all disciplines totally dependent on science and its method are implicated. It is therefore simplistic to assume that any resource that is scientific will be credible and reliable and visa versa. It is essential that the dimension of science is not the only criterion for selecting resources for the database-driven web site, but that it is an important one.

One of the major initiatives of NCCAM is to build the scientific body of evidence in research on the wide range of CAM's practices. Kirschstein (2007) claims that CAM research has been established as a legitimate field of scientific inquiry and that during a period of seven years 1,500 peer-reviewed scientific papers have been published. The emergence of integrated medicine and evidence-based medicine is a response to the challenges to maintain the authority of science and the importance of validity, funding, acceptance and recognition (Hyman 2005:20).

George Wald (1972:187), the Nobel Prize winning biologist, said the following:

> There are only two explanations as to how life arose; spontaneous generation arising to evolution or a supernatural creative act of God… There is no other possibility. Spontaneous generation was scientifically disproved 120 years ago by Louis Pasteur and others, but that just leaves us with only one other possibility… that life came as a supernatural act of creation by God, but I can't accept that philosophy, because I don't believe in God. Therefore, I choose to believe in that which I know is scientifically impossible, spontaneous generation leading to evolution

The guidelines of lifestyle choice should originate out of a systematic analysis of the physiological laws and causes that affect principles of health and healing. Wellness, discussed in section 2.2.4, and the WELLNESS framework, discussed in section 4.2, reflect the importance of the optimal functioning of every system of the body and mind working in perfect harmony in order to achieve and maintain a state of optimal health and psycho-physical well-being. WELLNESS is consistent with a scientific approach to health and is based on a wholistic knowledge of the laws of physiology and systems of the body. Health is a personal responsibility and is integral to a life of simplicity, naturalness and rationality.

Every philosophy or worldview throughout the history of mankind has reflected on basic questions such as:

- what is life?
- what is death?
- what is suffering?
- how can one recover lost health and secure immortality?

Frohock (2002:215) suggests that all of the standard narratives of medicine recognise their origins in natural cures and in religious or spiritual discourses. Paradigms on health and healing are a result of how these metaphysical questions are answered according to the worldview and belief system of both the proponents and the patients. Distinctions between alternative and

conventional medicine are variables of time, place and the attitudes of health care practitioners.

CAM does not belong to a distinctive category. CAM refers to a group of diverse medical and health care systems and practices reflecting a spectrum of worldviews, as well as a wide range of differences in worldview and health beliefs of CAM users (Geller & Francomano 2005:343). However, it is important to identify a worldview that is common to the various modalities represented in CAM and in conventional medicine.

4.3.2 Worldview

Conventional medicine reflects a particular set of beliefs that is essentially secular and scientific in contrast to CAM. Health beliefs including religious and spiritual worldviews differentiate CAM users. According to the literature (Childs 2004b; Geller & Francomano 2005; Hildreth & Elman 2007; Hirschkorn 2006; McClean & Shaw 2005; Sointu 2006), postmodern thinking is characterised by a growing skepticism about the ability of technology and science to provide answers to humanity's problems, including illness and chronic disease. This has precipitated a shift from concern with disease to alternative health practices and a subjective concern with health. There is a negative attitude towards the dominance of scientific knowledge, its reductionism and materialism in comparison to vitalism and holism, individualism, personalised self-care and the role of mysticism and life-world knowledge.

There are differing perspectives on the individual as a biological, social and spiritual entity. Healing in alternative medicine is understood to be a 'natural' process and is the interplay between science and spirituality. This infers that expert systems of knowledge and training are not necessary to be a healer. Personal orientation toward holistic sacred worldviews, a sense of health control, agency and empowerment, and personal characteristics of openness and creativity are domains associated with CAM use. These ideas are basic to CAM and CAM is part of a system that has a philosophical approach to

health and balance and does not just deal with symptoms. This has led to a growing interest in New Age and the Eastern approach to health care practices. Figure 4.2 (Barnes *et al* 2004) confirms the fact that there is a renewed interest in spirituality. Previously conventional medicine proposed that the use of prayer in healing was unscientific.

10 Most Common CAM Therapies—2002
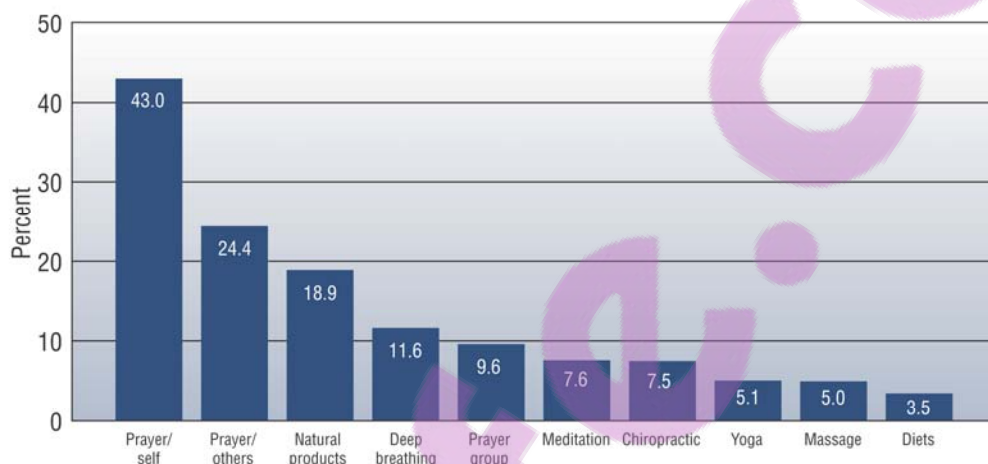
Figure 4.2 10 most common CAM therapies - 2002

Prayer for health reasons is the most commonly used therapy and the domain most commonly used is mind-body medicine (Barnes *et al* 2004). In cases of efficacy and prayer, CAM has a radically different paradigm that combines metaphysical conditions with hard empirical testing. Matthews, as quoted by Frohock (2002:228), found that those with strong religious beliefs recover more quickly from severe burns. Beliefs can contribute to one's condition.

The motivation of CAM users (Geller & Francomano 2005:343; Hirschkorn 2006; Hyman 2005; Reisser, Mabe & Velarde 2001; Schuster *et al* 2004a&b) includes the following:

- greater access to health information and the Web
- congruency with personal values and interest in self-care. Holism is an important value

- changing conceptions of the body

- treatment for chronic conditions and relief of pain especially when conventional medical therapies have failed. Conventional medicine is primarily disease-oriented and concerned with medication and drug treatment. Interest in prevention rather than cure

- better connection between practitioner and patient

- a general lack of attention by the physician as primary arbiter of medical information to the spiritual dimension and the growing recognition of the mind-body connection

- patients have an interior dimension of beliefs – believe something will work. Placebo versus medicinal effect and choice are important

- natural cures are the best

- wellness enhancement is a desired state of being and is an important aspect of the user's worldview

- the approach of CAM is perceived as being simpler, wholistic, with more emphasis on lifestyle issues such as diet and exercise, cheaper, and allowing more personal responsibility. The lack of training of medical practitioners in the importance of nutrition and exercise and other lifestyle factors precipitates an interest in other sources of health information

- many of the alternative therapies are perceived to be more than the treatment of disease as they serve as an entrance to spiritual technologies that deal with the need for meaning, power and knowledge

- questions about whether CAM therapies work are more important than if the therapies and substances are safe.

The interest in CAM reflects the user's worldview with reference to beliefs about health and healing and the importance of a complementary or even alternative medical system. As discussed in section 4.2, WELLNESS is integral to a worldview shared by those who subscribe to beliefs about health and healing in relation to the importance of lifestyle. The Judeo-Christian

tradition emphasises the importance of living a wholistic life in which the body, mind and spirit function in an integrated way.

During the nineteenth and twentieth centuries medical knowledge was faced with the interplay between science and mystique. What is now considered acceptable practice in conventional medicine were possibly suspect categories in the recent past (Frohock 2002:215; Hirschkorn 2006:570; Morreim 2003:216), but were regularised by scientific research. The worldviews of therapies characteristic of CAM, which have been identified as most used, will be discussed in the following section 4.3.3 on history in order to understand their origin. It is important to recognise the prevailing themes in the following discussion, namely the dissatisfaction with conventional medical practice, the struggles with science and research in contrast to what works for patients and the need to find practices that support health and healing as well as the failure to acknowledge that every practitioner's practice reflects a system of beliefs (Anderson & Jacobson 2003; Hirschkorn 2006; Morreim 2003; O'Mathuna & Larimore 2001; Shelton 2004; Willis 1997).

4.3.3 History

An important aspect in evaluating a medical/health system is to investigate its historical roots, who invented it and how it was developed. Frohock (2002:229) suggests that there is poetic justice in any historical line that begins with metaphysics, continues with natural science and comes back to metaphysics. Throughout history, humans have developed systems of belief in order to explain existence, reasons for human suffering and how to recover immortality and lost health. Essential questions that should be asked in order to establish credibility and reliability of any information source or resource are: what is the origin? and who is the founder? This is true also of any medical philosophy, as all medical systems reflect a system of beliefs. The following is a brief discussion of the history of some of the modalities known as CAM. The WELLNESS web site should provide access to WELLNESS resources to inform the user and this includes recognition of the freedom to make choices about their lifestyle, what factors are considered important and also the

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possible origin and therefore the authority of the source of information resources. It is not merely a matter of whether the resource is scientifically sound, but also that the tenets of an approach correlate with the five dimensions of the selection criteria model for the user to make an informed decision about the credibility of any resource.

CAM systems and practices may predate conventional medicine and yet their legitimacy is based on what the gatekeepers of conventional medicine characterise them as, that is either complementary or alternative. The following have been identified as the most popular among users of CAM and will be briefly discussed: osteopathy, chiropractic, naturopathy, homeopathy and acupuncture (Anderson & Jacobson 2003; NCCAM 2006).

4.3.3.1   *Osteopathy*

Andrew Taylor Still, disenchanted with conventional medicine founded the approach of Osteopathy. This worldview is basically mechanistic science, but with the idea that the body is able to make its own remedies against disease and toxic conditions when there is a normal structural relationship, adequate nutrition and good environmental conditions (Anderson & Jacobson 2003:142). Spinal manipulation is a key practice. This is supported by numerous scientific studies. Back pain continues to be a general problem of users for which conventional medicine has not provided satisfactory therapy (Kirschstein 2007).

4.3.3.2   *Chiropractic*

Daniel David Palmer worked originally as a magnetic healer and then developed an interest in the results of displaced vertebra. He was determined to find another way to heal besides using drugs (O'Mathuna & Larimore 2001:164). He researched the idea of spinal manipulation, which had been used for centuries, and worked out a series of procedures to bring health to muscles, organs and nerves that had moved out of alignment. This approach is defined as "a system of therapeutics based upon the claim that disease is

caused by an abnormal function of the nervous system" (Anderson & Jacobson 2003:150). The focus is on the musculoskeletal system and realignment of any parts of the spine to deal with disease and to ensure good health. It is advocated that the body has innate potential to heal but the use of drugs will interfere with this process. Regular exercise and a balanced, natural diet are valued (Anderson & Jacobson 2003:151). Although there is still a question about the relationship between misalignment and disease of the internal organs, scientific studies have supported the concept of spinal manipulation and practitioners are becoming recognised by conventional medicine (Anderson & Jacobson 2003:153). O'Mathuna and Larimore (2001:166) suggest that chiropractors differ in their spiritual beliefs, have varying levels of an evidence-base to their therapy and some may promote shamanistic and New Age beliefs.

4.3.3.3 *Naturopathy*

Benedict Lust trained as an osteopath and in chiropractic. He was interested in natural healing concepts. Key tenets of naturopathy include the following: toxins contribute to many illnesses; the violation of laws (diet, etcetera) is important; the person should be treated wholistically, which should include the physical environment; the body is inherently capable of healing itself; wellness prevention and non-invasive treatments are important; and that patients are personally responsible for their health. Therapy includes diet, exercise, rest, detoxification, plant-based remedies, homeopathy, hydrotherapy, acupuncture and physical modalities such as heat, cold, electricity, massage and spinal manipulation (Anderson & Jacobson 2003:158,159). The emphasis is on natural; thus supporting nature to bring healing versus unnatural or the use of pharmaceutical drugs and surgeries (O'Mathuna & Larimore 2001:248). Lifestyle change can be beneficial, as well as hydrotherapy, exercise and dietary intervention (Zollman & Vickers 1999:837). Scientific studies have not focused on naturopathy as such, but rather the various therapies used such as sunlight, whole-body hyperthermia (WBH) etcetera have been researched. It is possible that some practitioners reflect New Age thinking.

4.3.3.4 *Homeopathy*

Samuel Hahnemann, a German physician, developed homeopathy about two hundred years ago at a time when there was great dissatisfaction with conventional health care which was harsh and often ineffective (Shelton 2004:9). While observing and experimenting with what he considered to be milder and safer therapies, he found that substances seemed to induce in healthy people the same symptoms that they seemed to cure in sick people - the Law of Similars (O'Mathuna & Larimore 2001:222; Shelton 2004:15,16). Homeopathy is an approach to health care based on the concept that a patient can be cured by properly prepared minute doses of a substance which, when given to healthy people, induces the patient's symptoms. What appeals to many patients is that the practitioner prepares the remedy in the office.   This personalises the treatment.   Hahnemann explained the effectiveness of this treatment modality in terms of vital energy. There are allusions to the similarity with the prana of Ayurveda and the self-healing process of nature (O'Mathuna & Larimore 2001:222,223).   Homeopathy is best known for its ability to help in recovery from acute ailments. Homeopaths treat the whole person, not just the disease or the ailment. They believe that every person has a vital force, a nonphysical entity that is the essence of life that strives to keep us in good health that needs to be stimulated (Shelton 2004:36). Discernment on the part of the user is essential.

4.3.3.5 *Acupuncture*

This therapy originated in traditional Chinese medicine. It is based on the belief that there is invisible life energy, namely chi, which should flow properly through the body and keep the organs in balance. Blockage causes disease and inserting needles restores that flow.   Some conventional medical practitioners explain that the needles may release endorphins that regulate pain perception (O'Mathuna & Larimore 2001:147,148).   NCCAM and NIH have identified some conditions for which acupuncture could provide pain relief.

National Network of Libraries of Medicine (NNLM) Pacific Northwest Region (NNLM 2006) suggests that historic continuity, especially in the field of CAM, is an important dimension in considering health information. The fact that a practice/therapy has been successfully used for hundreds of years gives it some credence and if it has been used across several cultures that also shows consensus or agreement.

4.3.4 Wholism

An important component of the model of selection criteria should be that of wholism. Not only is this a reflection of the prevailing ideology of the New Age 'holism', but it is also an acknowledgement of the wholeness of the human being which is valued in contrast to the compartmentalisation of the specialty approach of conventional medicine. The question is whether the whole person, that is physical, mental, emotional and spiritual dimensions have been taken into consideration by the medical/health system. 'Wholism' is the preferred term for this study that identifies an orientation towards health and wellness that considers the whole person within his/her environment.

The history of science and various medical practices have recognised the importance of a systemic and wholistic view of phenomena. This idea has permeated both the exact and inexact sciences. Holistic medicine refers to the therapies that view the patient as a whole person and reflect New Age and Eastern thinking (Skinner 2002). The concept 'holistic' is commonly used in place of 'wholistic'. Gordon, as quoted by Willis (1997:85), defines 'holistic medicine' as a synthesis of all the techniques used in both Western and other cultures, in science and empirical use, which have been revealed as helpful. Former American Medical Association President, Malcolm Todd, as quoted by Willis (1997:86), states:

> It has been suggested that all modalities of treatment may be used in holistic healing; that is surgery, medicine, chemotherapy, radiation, nutrition, rehabilitation, yes, hypnosis, acupuncture, psychics, and, of course, religion. To achieve such a broad goal it will be necessary to tap the resources of our most learned scholars, our most sophisticated

researchers, and expert commissions and practitioners. For that ultimate goal is to use these authorities to teach an individual to assume responsibility for himself by modifying any unhealthy attitudes, values or lifestyles. Essentially, this is a matter of acceptance of some components as being religious or not.

Hyman (2004b:14) advocates consideration of the new paradigm, which allows personalisation of medicine and the opportunity to focus on optimising and enhancing health by understanding the complex high order functioning of the human being. Barrett *et al* (2003:937) reported that CAM users and practitioners expressed that holism, empowerment, access and legitimacy are important in their pursuit of personal health. Instead of treating illness as in conventional medicine, holistic medicine approaches treatment from the overall physical, emotional, mental and spiritual being. The systems of the body are believed to be interdependent parts of the whole being. The natural state is health while illness/disease is an imbalance in the system. Prevention is also valued in the optimisation of health. The techniques used are non-invasive and chemical. Other harmful substances are avoided. Nutrition is considered to be an important therapy. The principle of holistic healing is to balance the body, mind, spirit and emotions in order for the whole being to function optimally and to restore harmony (Skinner 2002).

Some of the major therapies that claim to be holistic are:

- herbal medicine
- homeopathy
- naturopathic
- traditional Chinese medicine
- chiropractic
- stress reduction
- nutritional therapies
- psychotherapy
- massage (Skinner 2002).

One of the reasons why the New Age and related therapies have gained momentum is their emphasis on holism. This is congruent with the user's worldview on health and life in general, that is wholism. The over-emphasis on the scientific underpinning of most disciplines, specifically the medical model, which focused almost exclusively on the physical, the natural and the material, resulted in a neglect of the spiritual dimension of illness. The reality of psychosomatic disease requires a wholistic approach and an integrated approach to how the body, the mind or the soul and the spirit work together. A description of the physical and psychological process of stress should include the body and the mind, as well as those stressors that affect one's spirit. It is the mind that interprets the sensations picked up by the five senses. The way in which it responds is the result of the way in which we think. This informs our attitudes and values about life. Dr Bourne, a practitioner specialising in anxiety disorders, as quoted by Anderson and Jacobson (2003:67), explains:

> In my own experience, spirituality has been important, and I believe it will come to play an increasingly important role in the psychology of the future. Holistic medicine, with its interest in meditation, prayer and the role of spiritual healing in recovery from serious illness, has become a mainstream movement in the nineties. I believe there will be a 'holistic psychology' in the not too distant future, like holistic medicine, which integrates scientifically based treatment approaches with alternative, more spiritually based modalities.

The discussion above has highlighted the importance of the rationality of the user and the objectivity of the information provider in the selection of resources. It is important to provide quality information based on the assumption that the user will value an approach that recognises the importance of discernment.

4.3.5 Discernment

Discernment is to be understood in the context of the volition of man or his ability to choose. To choose assumes that one can discern or distinguish between that which is harmful or beneficial; good or bad; beautiful or ugly;

right or wrong. It presupposes the ability to think rationally. It also presupposes that a choice should be made. The statistics and facts cited in Chapter two concerning the consequences of lifestyle choices and their effect on the health of an individual imply that we are not surrounded with that which is meant for one's optimal health, but rather that information is needed in order to make rational choices. The fact that medical practitioners are fallible and that hundreds of thousands of people die each year as a result of medical malpractice emphasises the importance of this concept of discernment (Fox 2006; Frohock 2002; Hess 2004; Hirschkorn 2006; Hyman 2004b; Morreim 2003). The over-dependence on the medical fraternity has somewhat diluted the importance of individual responsibility for personal health and also for making wise choices about treatment when needed. The growing trend to distrust science and to put increasing trust in mysticism which permeates many of the 'alternative' approaches demands a new sense of responsibility for developing critical thinking skills, evaluation of claims and the assessment of risk (Campbell & Campbell 2004; Childs 2004b; Rees & Weil 2001; Schuster *et al* 2004a&b).

Discernment has to do with assuming personal responsibility for one's health. Shine (2001:s145) refers to the fact that people should be fully informed of the evidence that is available for making rational choices. It is an unfortunate question, but maybe one needs to ask in this context: do you really want to be healthy? do you really desire wellness? A positive answer to these questions will be reflected in assuming responsibility by taking the necessary steps to be well and healthy. However, it is important to make information available and accessible in accordance with this principle of freedom of choice. The context for the design of this database should keep the user in focus.

Discernment is particularly significant in the context of health and healing practices, which acknowledge spiritual dimensions that may not correlate with one's particular worldview. As disenchantment with conventional medicine increases, there is the possibility that any practice or procedure that relieves pain or even promises miraculous cures and healing could confuse the issue of the need for reliable and credible information. This is reflected in the

'reflexive consumer' and 'informed choice' concepts (Henwood *et al* 2003; Kivits 2004; Lupton 1997; Prior 2003). It is also important in the choice of quality web sites as the user needs to be discerning, but also the provider needs to use discernment in the selection of the resources for that web site.

Discernment includes making decisions about the worldview and the assumptions that undergird the particular CAM practice. Besides checking the evidence of the therapy, health information seekers may also gather information about the spiritual and world views of the therapist. A tool, the mnemonic SPIRIT, used by the medical profession to ask patients questions about spirituality could be used by the health information seeker to ask the same type of questions of the therapist. These include questions about the therapist's spiritual belief system (S), their personal spirituality (P), their integration into a spiritual community (I), rituals and restrictions they practice (R), implications of their beliefs in care and therapy (I), and their terminal care ideas (T) (O'Mathuna & Larimore 2001:140). This brings into focus the importance of identifying the worldview of those involved in the health relationship, as well as the need for discernment.

Essentially, this dimension of discernment needs to be understood in terms of a process of making choices for the selection of resources that includes the other four dimensions. This process needs to be understood by the user of a database-driven web site that makes resources available. It is a process that needs to be used by health information seekers and users of procedures and practices of any medical approach. Firstly, the history of the product, founder and distributor should be identified. Supporting information should be studied. The worldview should be identified. O'Mathuna and Larimore (2003:251) recommend that when a practitioner promotes a philosophy or beliefs the user should be discerning. To ensure that a wholistic perspective is being supported, question whether the root cause or only the symptoms are being dealt with. This is basic to understanding whether the procedure or practice is in accordance with the laws of physiology and therefore scientific. The importance of supporting rather than burdening the immune system is a key

factor in making lifestyle choices for optimal health. Discernment is basic to living a balanced, healthy life in the context of self-care and wellness.

The five dimensions of the selection criteria model provided a framework for the selection criteria. For both the WELLNESS health information seeker and the health information provider to be assured of the quality and credibility of the health information resources selected a set of selection criteria was detailed.

4.4 SELECTION CRITERIA

Quality of a web site had to be considered with reference to content and design. Factors that related to content were differentiated from those related to quality of web site design. In this section the criteria for selection are relevant to content. Section 7.2.4 discusses web site design quality criteria. Sources of information and resources form the content of the WELLNESS web site. The concepts 'source' and 'resource' were discussed and defined in section 1.9.5. Content will include resources that reflect a wellness approach. This will include details of books, articles, videos, DVD's, links to relevant resources such as web sites that reflect various components of WELLNESS, for example nutrition and exercise, health information portals, applications, services and metadata, etcetera (Rosenfeld & Morville 2002:25). The content of the WELLNESS web site will be selected by the content provider according to the set of criteria identified.

In order to encourage user discernment, the set of criteria will be provided to the user to assess the quality of web sites, of links, of resources and of the information that is provided on the WELLNESS web site. Links to trusted groups such as MEDLINE, MLA and AMA web sites and to evaluation instruments will be provided as tools for the user to assess quality and relevance of content.

The content selection criteria selected were based on the quality assurance factors of information as discussed by the following authors (Adams & Berg

2004:15; AMA 2003; Burkell 2004:496; Calabretta 2000:4; Childs 2004a:15; Crespo 2004:366; Duffy *et al* 2003:281; Dutta-Bergman 2004b:254,257,259; eEurope 2002:e15,21; eHealth ethics initiative 2000; Eysenbach *et al* 2002; Eysenbach & Kohler 2002:574; Fogg 2002; Fox & Rainie 2002:33-34; Garnes & Mills 2001:183; Tombros, Ruthven & Jose 2004:327; Godin,Truschell & Singh 2005:72; Greenberg, D'Andrea & Lorence 2004:e18; Gummerus *et al* 2004:175; Health on the Net (HON) Foundation 2003a; Health Summit Working Group (HSWG) 1999; Kunst & Khan 2002:44; MLA 2007; NCI 2003; NIH 2003a&b; NLM 2006; NNLM 2006; Purcell, Wilson & Delamothe 2002:557) to compile a list of selection criteria that correlate with the five-dimensional model.

Figure 4.3 identifies the criteria by which to evaluate quality information and make selection decisions.
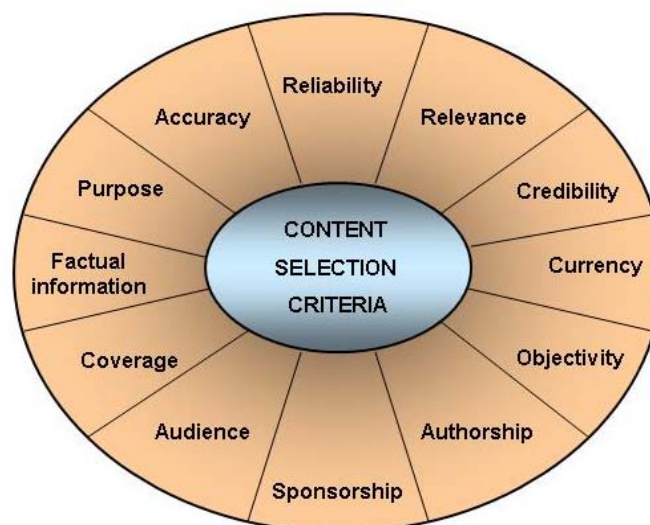
Figure 4.3 Content selection criteria

4.4.1 Reliability

Reliability connotes information that is trustworthy, dependable and believable. This relates to authorship and sponsorship - who is responsible for the content. Trustworthiness is established by referencing of information, stating claims and benefits, by links and a disclaimer regarding the authority of the professional care practitioner/provider (PCP).

4.4.2 Relevance

Content relevance includes accuracy, reputation of the source, availability, personal factors such as novelty of the information, ability to understand the information and clear presentation of the information.

4.4.3 Credibility

Credibility includes acceptability and reliability of the source, currency, relevance and evaluation. Credibility implies that the source of information and resources selected are quality, accurate, complete and trustworthy. By providing links to more than one web site, the WELLNESS health information seeker will be able to compare and evaluate resource credibility for themselves.

4.4.4 Currency

Information currency is an important criterion to consider in selection as health information changes frequently and is particularly relevant when considering web site content. Information should be up-to-date as users expect this. Publication and review dates, when substantive changes were last made, and when information and the web site are updated, should be established.

4.4.5 Objectivity

Objectivity requires that the content should be selected and presented in as objective and balanced way as possible, avoiding bias.

4.4.6 Authorship

Transparency and integrity are important to the health information seeker. Lists of authors, organisations and credentials, references and citations support credibility. There should be accountability for the content which means that the authority of the source should be clear and responsibility for the upkeep of the web site declared, as well as openness to evaluation of both. Reference to the origin and worldview reflected in the content supports discernment of the user. The policy of disclosure should be clearly stated.

This includes the fact that the webmaster will not assume the role of consultant or cyber doctor as the intention is to provide access to resources.

4.4.7 Sponsorship

Sponsorship helps to establish whether the web site and content is respected and dependable, as well as other web site resources that are included as content. Sponsorship refers to the organisation that is responsible for the content and who pays for it. The question has to be asked about support, whether it is supported by public funds, donations or by commercial advertising? Commercialisation of health information is increasing and products and promotions are the focus of e-health.

4.4.8 Audience

Content should be appropriate to the intended audience, that is the WELLNESS health information seeker user profile, literacy and special needs. The use of terms and language should be appropriate for the audience. A clear direct style supports the perception of quality.

4.4.9 Coverage

Health information is considered by the user as complete when decisions and choices can be made. Completeness is defined as having all the necessary parts, elements and steps. Interaction between message completeness and Web use motivation is part of the way in which the user judges credibility. A claim should have all the necessary elements such as claim assertions, evidence and authority, in order to back it up and for it to be logical. The discussion of the health topic should be comprehensive, balanced and adequate. Complete health information presents the positive effects of a particular behaviour, but also explains the process underlying the effects and, when applicable, possible side effects. The more complete the information, the stronger the argument, the more relevant, accurate and current the information, the more equipped the user is in making a decision based on that information. Content cues and source cues are basic to the motivation of the user and the persuasiveness of the message.

4.4.10 Factual information

In order for the WELLNESS health information seeker to make judgments on the quality of the information, a description should be given of how the content is developed for the site, what sources have been used, links or references to the sources, how the content is evaluated and by what criteria links to other sites or services are provided. Primary information rather than opinions should be given in a clear way and verification from primary sources should be facilitated by means of links and abstracts.

4.4.11 Purpose

The user should be satisfied that the information matches the stated and implied purpose and objectives. Besides the immediate purpose, the user will probably expect improved health due to changed lifestyle behaviour.

4.4.12 Accuracy

The content should be checked to ensure that the information is error free, based on evidence and it can be verified. The lack of a review and revision process on the Web means that not all Web pages are reliable and valuable. Documents can be easily copied and falsified or copied with errors and omissions.

Figure 4.4 illustrates the relationship between the content selection criteria and the five-dimensional model of selection criteria to be used in the selection of the sources and resources for the WELLNESS database-driven web site. All of the content selection criteria listed above support a holistic view of WELLNESS information in the context of the five dimensions.
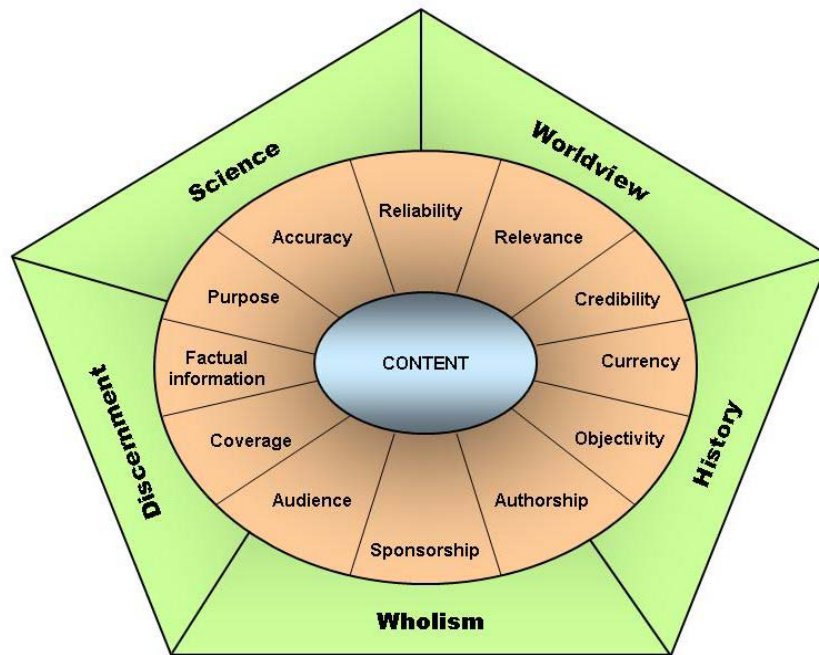
Figure 4.4 Content selection criteria within five-dimensional model

4.5 CONCLUSION

This chapter identified selection criteria to be used to provide relevant, reliable, quality and credible WELLNESS health information resources according to a five-dimensional model. The selection criteria provide a means by which the WELLNESS health information provider and the WELLNESS health information seeker can evaluate WELLNESS health information resources. These five dimensions can be used by the WELLNESS health information seeker as criteria to evaluate resources found. The framework for the WELLNESS approach was outlined so that information sources and resources can be selected in order to provide structure and content for the WELLNESS web site.

The WELLNESS approach will identify and provide terms to be used in the provision of access to WELLNESS resources. Support of the interaction between the user and the database-driven web site will be strengthened by the use of consistent and standardised terminology in the form of a thesaurus. The construction of the WELLNESS thesaurus will be the focus of Chapter five.

CHAPTER FIVE

WELLNESS THESAURUS CONSTRUCTION

5.1 INTRODUCTION

The focus of Chapter five is on the construction of the WELLNESS thesaurus – a controlled subject vocabulary – to bridge the gap between the WELLNESS information sources and the WELLNESS health information seeker information need. The WELLNESS thesaurus as tool supports user search and retrieval activities. Chapter four identified criteria for the selection of relevant, reliable and credible resources according to a five-dimensional model. The responsibility of the researcher is to represent this information and make it accessible to the user. The construction of the WELLNESS thesaurus ensures consistency and standardisation in terminology, provides an access point to WELLNESS resources, show relationships between terms and supports indexing and information search and retrieval.

The discussion will include the reasons for the choice of a thesaurus as indexing tool and the characteristics and functions of a thesaurus. Various models of the stages/steps in the construction of a thesaurus will be compared to determine the model of the stages to be used in the process of constructing the WELLNESS thesaurus.

5.2 CHOICE OF THESAURUS AS INDEXING TOOL

The Web and a WELLNESS database made available via the Web can facilitate informed decision-making by individuals about their personal health and well-being as discussed in section 3.2. Informed decision-making requires access to, understanding of and the ability to process and evaluate quality information. Access also requires an ability to derive meaning from the text. One of the key factors in the operation of an information representation and retrieval system such as the database-driven WELLNESS web site, is the control of terminology. Haard, Slater and Long (2004:413) state that this

demands from the designer a balance between reliable, authoritative content and the ease of use of the web site. This results from a careful consideration of those terms that will support the user's health information-seeking activities.

The increased interest of health seekers/consumers in accessing health information on the Web and the development of e-Health has highlighted problems in the terminological control of health information and in the search for and retrieval of relevant resources such as:

- mass of health information online
- individual's level of health literacy
- diversity of consumer health group
- typical bibliographic records and online resources differ with regards to retrieval mechanisms
- vocabulary and terminology, that is consumers of health care, particularly those who are laypersons, lack familiarity with the professional vocabulary and concepts used by health care providers. Conversely health care providers are not always familiar with the vocabulary and concepts used by consumers
- dominance of conventional medicine is reflected in the use of medical terminology in health care information which contributes to the difficulties of understanding and using appropriate terms and concepts by the health consumer
- interdisciplinary nature of the new paradigm in health care, that is conventional medicine, CAM, computer science, information science, public health and promotion which expects a consumer to know the jargon and terminology of each discipline represented
- the terminology in health information is often problematic because it may be imprecise and is continuously changing. Shifts in denotation and connotation create standardisation problems
- tension between the need for scientific explanations as evidence and the use of appropriate language and terms and the problem that users may have in understanding the scientific/medical terminology

- differentiation between science and pseudoscience, that is scientific literacy which includes the following: a command of basic terms in science; an understanding of the scientific process; and a sociological understanding of the activities of science

- the need to know the terms that will contribute to the credibility of the content of the web site

- health term familiarity, health care experience and motivation, and various formal and informal sources of health-related terms (for example media, personal experience)

- using information technology for health requires e-Health literacy which is the ability to read, use computers, search for information, understand health information and put it into context (Haard, Slater & Long 2004; Keselman *et al* 2007; Lancaster 2003; Norman & Skinner 2006a; Zeng *et al* 2007; Zeng & Tse 2006).

In response to the problems listed above and for the purpose of this study, the researcher researched the literature to identify a tool that would best provide subject access to the WELLNESS resources and develop the WELLNESS vocabulary. Various initiatives have and are responding to the problems listed above. These include consumer health vocabulary (CHV) research and development with the goal of overcoming the vocabulary gap between consumers and health information provided by informatics applications; and controlled vocabularies to standardise terminology such as Systematised Nomenclature of Medicine (SNOMED), International Classification of Diseases, Ninth Revision (ICD-9), Unified Medical Language System (UMLS) sponsored by The National Library of Medicine (NLM) (McKnight 2005:21; NLM 2007; Patrick *et al* 2001; Zeng *et al* 2007).

The researcher assessed these various initiatives and the forms of health and medical vocabulary each provided to establish whether any were suitable for use in this study. It was determined that none of these provided a relevant source of controlled vocabulary terms for the study at this time. However, continuous reference to these initiatives is important to determine future suitability and relevance for the further development of the WELLNESS

thesaurus. Recommendation will be made in Chapter eight to follow the research and development of these CHV initiatives for possible use in further development of the WELLNESS thesaurus.

In researching the choice of 'tool', the researcher, as information professional, was confronted by the choice between a keyword list, subject heading list or a thesaurus as tool used to index or tag documents for the purpose of WELLNESS information storage and retrieval. A keyword list is the simplest form of indexing language. It consists of an alphabetically arranged selection of terms used as descriptors in indexing. The keywords are often derived from the text itself, either intellectually by the indexer or by machine extraction from electronic text. The level of control associated with this type of tool is very low. Advantages of the keyword list are that the terms are closely associated with the documents indexed and can reflect the content more closely. New terms can be quickly incorporated and obsolescent ones not used. Disadvantages are that synonyms are not identified; documents with similar subject content may not be indexed as such and not retrieved. There is typically no way for the indexer to navigate this type of vocabulary to find alternative indexing terms. There is a complete lack of cross-referencing which makes it impossible to identify other relevant terms or to know what terms are available except by scanning the whole list of keywords (Broughton 2006:20). Due to the nature of health information, specifically WELLNESS health information, the researcher determined that a keyword list would not be an appropriate tool for use in indexing and information storage and retrieval.

Subject heading lists are more sophisticated than keyword lists with respect to the level of management of the terms. The entries in a subject heading list look very similar to keywords, but every term is supported by cross-references which serve as navigational aids. This makes the indexer aware of synonyms, more general terms and more specific terms. Related terms (RT) is also used for terms related in other ways. A subject heading list can look very much like a thesaurus due to the similarity of format, but often it is developed in an impromptu manner as a response to the needs of the documents to be indexed rather than built logically as a thesaurus is

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(Broughton 2006:21). A subject heading list was preferred above a keyword list, but because of the nature of health information and the problems associated with the representation and retrieval of this type of information it was not selected as a tool for indexing and information representation and retrieval.

A thesaurus is a tool for subject indexing of documents or other resources that recognizes and indicates the relationships between the terms which it contains and in which vocabulary control is exercised. A properly constructed thesaurus consists of a systematic display of terms showing the structure of the subject and an alphabetical display in which the relationships between terms are indicated by the thesaural relations (Broughton 2006:224).

The thesaurus as indexing tool was preferred above a keyword list and a subject heading list for the following reasons:

- it is a type of controlled vocabulary
- used when there is a need for terms (descriptors) to describe the subject content of documents
- it is the most fully developed form of the alphabetically presented indexing language
- it deals with vocabulary control and navigation in a systematic and logical manner
- the underlying systematic structure facilitates the derivation of an alphabetic display which functions as a list of descriptors for document description and indexing
- it is a clearly identified subject structure and hierarchical relationships of the classification/taxonomy are used to generate cross-references and navigational aids of the alphabetic display
- its dual format forms a bridge between the systematically organised indexing language and the word-based language

- its hybrid structure allows the fulfillment of a number of subject indexing roles, for example function as a map of subject domain and browsing tool to reveal different levels of hierarchy
- used to provide subject keywords in various metadata schemes for web published documents (Broughton 2006:6,20-23; Garrett 2003:106).

Further research evidenced that the development of a controlled vocabulary - that is a thesaurus and a list of terms that reflects an intersection between the vocabulary of the lay and the expert user - are important to deal with the problems of vocabulary in the indexing, searching and retrieval of health information resources, specifically WELLNESS health information resources. The use of the thesaurus, as controlled vocabulary, is receiving renewed interest in the digital arena, especially in the Web context (Marshall 2005:120; Rosenfeld & Morville 2002:176). It is often the preferred indexing tool for those working with digital resources. This has relevance for this study. Controlled vocabularies also help to create consistency across the content of a web site. Many information professionals insist that the only way to discover resources on the Web is by the provision of access to full-text (Chu 2003:41; Lancaster 2003:248). On the other hand, it is believed that controlled vocabularies that have been expertly developed and maintained are basic requirements of a mediated service for all sorts of users (Miller 2007:153).

Based on the above-mentioned reasons, the researcher made a decision to use the thesaurus as indexing tool and controlled vocabulary for the database-driven WELLNESS web site. It was necessary to identify the characteristics of a thesaurus in order to construct the WELLNESS thesaurus.

5.3 CHARACTERISTICS OF A THESAURUS

The resources to be included in the database-driven WELLNESS web site should be represented and described by means of indexing, abstracting

and/or descriptive cataloging procedures. A thesaurus is a form of controlled vocabulary from which indexing terms are drawn. It provides information which is meant to be used by indexers, indexing systems, searchers and end-users and is fundamental to the fields of text mining and information retrieval (Lancaster 2003:1; Losee 2007:1). A thesaurus is the "most fully developed form of the alphabetically presented indexing language since it deals with vocabulary control and navigation in a systematic and logical manner" (Broughton 2006:23).

The characteristics of a thesaurus (Aitchison, Gilchrist & Bawden 2000:17; Broughton 2006:4; Foskett 1996:89; Lancaster 1972:1, 2003:19; Losee 2007:1; Morville 2003; Pao 1989:119; Rosenfeld & Morville 2002:176) are as follows:

- organised and structured list of terms, phrases and metadata
- a controlled vocabulary with hierarchical, synonymous, associative relationships among terms
- a priori relationship between concepts is explicit
- only a word list without general, specific and related terms
- primary arrangement is alphabetical
- covert hierarchical structure
- displayed in a standard format
- a vocabulary of controlled indexing language.

The characteristics of a thesaurus indicate the requirements of a thesaurus and provide a framework for the development of the WELLNESS thesaurus. It was established that a thesaurus is an organised, structured list of terms in which the relationship between terms is hierarchical, synonymous, associative and the standard format of display is alphabetical. The thesaurus performs specific functions as a tool for information representation and retrieval.

5.4 FUNCTIONS OF A THESAURUS

A thesaurus performs specific functions. For the information professional, the function of a thesaurus is to index, organise and describe information. For the end-user, the function of a thesaurus is to support their retrieval of relevant items when searching and browsing for material about a particular subject. A thesaurus assists in the comprehension of the subject matter by suggesting and providing leads to the most precise, accurate and appropriate index terms and anticipating the criteria expected in searching as search requests made by the user (Pao 1989:118; Soergel 1974:8). The construction and use of a thesaurus provides both control and flexibility. In addition a thesaurus functions to:

- help users find the information needed
- define or determine scope of terms
- be a lens to view the network of relationships between systems
- provide a satisfying user experience
- show semantic and generic relationships between single concepts in a specific area of knowledge or that are found in a natural language
- be used as a retrieval tool
- provide word-based or alphabetic approach to information retrieval
- guide for both input and output
- be used for subject indexing and retrieval of documents
- refer the user to other terms in the vocabulary
- cross-reference other terms that are more general, specific and related in the vocabulary
- cross-reference to help the indexer navigate vocabulary and select most suitable terms to describe documents
- help in the choice between synonyms and near synonyms when they occur
- map variant terms including abbreviations, acronyms, alternative spelling, synonyms to a single preferred term for each concept

- map hierarchical relationships to assist users who express their need at a broader or narrower level of specificity than that used to describe the document (Broughton 2006:4; Foskett 1996:89; Lancaster 1972:1, 2003:19; Losee 2007:1; Morville 2003; Pao 1989:119; Rosenfeld & Morville 2002:176).

Controlled vocabulary, indexing, structure, search (query formulation and expansion) and retrieval, browsing and navigation and source of metadata are important and specific functions of a thesaurus that should be discussed in light of the functions of the WELLNESS thesaurus.

5.4.1 Controlled vocabulary

Controlled vocabulary is another term for controlled indexing language which is "a system used for classifying or indexing documents which uses a more limited set of terms than are found in natural language" (Broughton 2006:210).

According to the National Information Standards Organisation (NISO) (2005), controlled vocabularies serve five purposes:

- translation: provide a means for converting the natural language of authors, indexers and users into a vocabulary that can be used for indexing and retrieval
- consistency: promote uniformity in term format and in the assignment of terms
- indication of relationships: indicate semantic relationships among terms
- label and browse: provide consistent and clear hierarchies in a navigation system to help users locate desired content objects
- retrieval: serve as a searching aid in locating content objects.

Aitchison, Gilchrist and Bawden (2000:6) compared the strengths and weaknesses of controlled and natural language. The important points to

consider in this study were the difficulties of medical and health terminology, the level of health literacy of the WELLNESS health information seeker and the importance of facilitating the searching processes of the user, that is the WELLNESS health information seeker. The choice of natural language may match the terms used naturally by the user, but the burden of intellectual effort is put on the searcher instead of on the indexer. The researcher determined to use a controlled vocabulary, the WELLNESS thesaurus, to identify and specify the WELLNESS terms to be used in information representation and retrieval. This would aid the searcher and put the burden of intellectual effort on the indexer.

According to Rosenfeld and Morville (2002:186), the main reason for using a controlled vocabulary in which the associative, equivalence and hierarchical relationships are identified, is for improved retrieval. The objective is to use preferred terms to control terminology and prevent retrieval problems due to terminology problems (Soergel 1974:3). The construction of a WELLNESS thesaurus as controlled vocabulary will control WELLNESS terminology and aid in WELLNESS health information representation and retrieval. Franks & Kunde (2006) suggest that a controlled vocabulary is used to standardise terminology and can be the source of metadata. The thesaurus is also an authority list that incorporates some form of semantic structure to control synonyms, distinguish homographs and link terms whose meanings are closely related (Lancaster 2003:19). It serves to ensure consistency and consists of a vocabulary and syntax. Chifwepa (1998:81) suggests that where there are well-defined user groups such as the WELLNESS health information seeker group, one can be more selective in the language used and there is more specificity because the assumption is that a closed lexicon is shared. Aitchison, Gilchrist and Bawden (2000:17) offer the following ways of controlling terminology:

- controlling the form of the term
- making a choice between two or more synonyms to express the same concept

- making a choice on whether to admit, how to treat types of terms
- restricting the meaning of a term to the most effective use with regard to a particular thesaurus by means of scope notes, definitions, qualification of homographs.

5.4.2   Indexing

A thesaurus serves two purposes, namely to provide an authority list of index terms and a structured display of relationships between index terms to aid in indexing and searching (Lancaster 1972:1).   The purpose of indexing is to provide access to information.   It is the key to a faster retrieval system and makes maintenance of the database easier (Chang 1993:30).   Indexing refers to the activity of describing the contents of a document by using one or several index terms often selected from a controlled vocabulary.   Tessier, in Lancaster (2003:349), refers to the similarity between conventional indexing and hypertext linking on the Web.   Hypertext authors link text in ways that are similar to the ways that would be linked in conventional indexing.

An indexing term is the representation of a concept, known as a descriptor or keyword.   It may be a preferred or non-preferred term.   These terms serve as access points to locate and retrieve an item in a subject search in an electronic database such as the WELLNESS database-driven web site (Aitchison, Gilchrist & Bawden 2000:17; Lancaster 2003:6).   The term selected should be considered as the most useful to the user and for the information professional, the one that most clearly defines the concept.

Indexing controls the usage of terms, reduces ambiguities, deals with natural language as used in documents, as well as of the topics searched by the user into a mutually precise language.   The title of any entity (considered an access point) included in the database will be dealt with in the indexing process, as the title generally reflects the subject terminology and is stated using key terms.   Beyond the random selection of 'key words' from titles or text, lists of authorised words are basic to controlling information files.   Index

terms are arranged in groups which are subdivided into smaller subgroups. These subgroups represent related categories. Problems of synonyms, homonyms and ambiguities are handled by means of scope notes and cross-references. When indexing, decisions have to be made about the regulation of the form of the term; whether the singular or plural form will be used and whether the hierarchical relationship is valid (Aitchison, Gilchrist & Bawden 2000:19). Soergel (1974:19) comments that indexing is an intellectual task and as such, cannot be automated.

5.4.3 Structure

A thesaurus provides systematic structure. Relationships between terms are identified, organised, documented and displayed visually. There are three types of term relationships, namely synonymous, hierarchical and associated. The alphabetical display in which there are cross-references to other terms and terms are listed in A-Z order which provides further structure. Documenting relationships between terms (broader, narrower, related) provides a more complete picture of the entire range of concepts that will be found in the content and which will also inform the architectural structure of the web site (Broughton 2006:49; Garrett 2003:104). The more detailed information about the content, the more flexibility there is in structuring the web site.

5.4.4 Search (query formulation and expansion) and retrieval

The main reason for the construction of the WELLNESS thesaurus is to support searching and retrieval. A thesaurus is developed in order to match search terms and index terms to facilitate effective and consistent searching by: using a standard vocabulary to encourage uniformity of practice and easier exchange of information; vocabulary control; and determining relationships between terms and cross-references (Broughton 2006:39). If it was known how people use terms, it would simplify the problem of knowing what terms are used and which terms to include as indexing terms. However, decisions should generally be made on estimates of future behaviour of the

user, in this case the WELLNESS health information seeker (Losee 2007:2). The WELLNESS health information seeker profile, outlined in Table 3.9, informed the process of constructing the WELLNESS thesaurus. The most important entity identified from user requirements in the original study (Steyn 1999) and set out in Annexure one, Table 6.5 was 'Subject'. To facilitate an answer for subject queries, other entities in relationship with subjects that need to be included are related terms, narrower terms, broader terms and unauthorised terms. These will serve to guide the user in the searching process. This is also an important consideration in usability and user-friendliness of the WELLNESS web site. Separate tables, set out in Annexure one, (Tables 6.6-6.9) were formulated for each of these entities to deal with the complexity of the relationships among these entities. For clarity, the subject was identified as an entity, but the concept 'descriptor', defined as a term assigned to an entity to describe its subject matter, was used to designate each individual term. Descriptors are the working terms of a vocabulary and are also known as index terms or keywords (Harter 1986:37).

A thesaurus can be used in two different ways as a search tool by modifying the way in which a search or query is put together. One way is to make the controlled vocabulary visible to the end-user as an aid to query formulation. The second is to embed the thesaurus in the search software used to support query expansion. With the development of online resources it has become easier to make the indexing vocabulary visible to the searcher through the use of hypertext links. Searchers are able to view the vocabulary, to see what terms have been used in indexing, to select appropriate terms for framing a search and to modify searches through the cross-references in the thesaurus. A thesaurus used in this way becomes a search thesaurus (Broughton 2006:33). The thesaurus may help to improve retrieval, without ever being seen by the end-user, when it forms part of the search software and terms in searches are mechanically matched against the controlled vocabulary. Alternative or additional terms can be entered into the query by the automatic use of the thesaurus cross-references. This can happen as a matter of course or in response to poor search results. The software can expand the search by broadening the topic, adding more specific topics or searching on

synonyms and related terms. In the majority of cases where the thesaurus is used as a source of descriptors or metadata it will not be available to the user. In other cases the systematic structure of the thesaurus is evident which allows it to be used as a browsing aid (Broughton 2006:34).

5.4.5 Browsing and navigation

In the online environment, the thesaurus is often used as an aid to navigation or browsing through the systematic display. The browsing function is supported by the rules of ordering (Broughton 2006:153). The correct sequence of elements allows items to be located precisely. The thesaurus can be searched for individual terms or browsed through the facet hierarchies (Broughton 2006:34). Implicit in the structure of the Web is a form of indexing which facilitates browsing and navigation. These hierarchical relationships, developed and presented in a taxonomy, can be navigated by using hypertext to access more specific sub-categories or deeper levels of the hierarchy (Broughton 2006:16). Marshall (2005:121) suggests that both a browsing list and search capabilities should be provided. Asking questions about what materials will be searched is a good place to start when gathering terms.

5.4.6 Source of metadata

Information about content, context and structure of records is critical as the volume of digital information increases. Metadata is data about data that is structured to describe an information resource (Lancaster 2003:12,343). It is "the term used for information attached to a document or resource that describes various features of the document" (Broughton 2006:216). Franks and Kunde (2006:56) quote the ISO15489 definition of metadata as "data describing context, content and structure of records and their management through time". Metadata can guide the user in resource discovery. It is a structured format and controlled vocabulary that facilitates a precise description that supports comprehension of location, content and value. The availability of consistent, accurate and well-structured descriptions of resources could enable greater search precision and relevance ranking (Gill

2000:6). Generally metadata such as the creator/author, title, subject content, date of origin, etcetera is assigned by an indexer. Metadata needed for Web resources may have to describe whole collections of records rather than individual items (Lancaster 2003:346). Metadata can help to improve the searches on web sites and effectiveness of retrieval of Web resources by including a range of terms that the searcher can use. Metadata can also improve the ability to maintain and track content. To appreciate the importance of metadata, it is important to understand its function.

According to the U.S. Government (2007) guide to managing U.S. government web sites, metadata is important for the following reasons:

- it provides a standardised system to classify and label Web content
- it supports web site maintenance and administration
- it improves search relevancy
- it provides an audit trail (information about who created the information and when it was created)
- it helps identify redundant, duplicative and possibly obsolete content
- it identifies similar content so you can establish logical links and other relationships
- it allows information to be tracked and assembled.

Franks & Kunde (2006:56) cite the NISO and the Minnesota Electronic Records Management Guidelines to clarify the importance of metadata as follows:

- metadata facilitates users' location and evaluation of data
- metadata is structured information
- it is used to identify and contextualise records, people, processes and systems that create, manage and maintain records
- it makes it easier to use, archive, retrieve and manage an information resource

- it supports verification of ownership, authorship, authenticity and uniquely identifies a record over time and provides context
- it facilitates data sharing, preservation of records and describes content
- it forms bridges between depositories of information.

By using only one term for each unique concept in the content, one can rely on automation to help define the connections between the content elements. The web site should dynamically link together all the pages on a specific topic without anyone having to do anything more than use the same term consistently in the metadata (Garrett 2003:106). Good metadata can provide a faster and more reliable way for users to find information on the site than a basic full-text search engine can provide. Connecting the search engine with a thesaurus and providing metadata for the content can help to make the engine smarter. The search engine can use the thesaurus to map a search for a disallowed term to a preferred term and then can check the metadata for that preferred term. This gives the user highly targeted, relevant results, as well as recommendations for other related subjects that might be of interest (Garrett 2003:106). The WELLNESS thesaurus will make a contribution to the metadata needed for Web resources, especially subject metadata, and can also be a source of metadata.

A well-constructed thesaurus will function as a controlled vocabulary, an indexing tool, provide structure, enable search and retrieval, allow for browsing and navigation, and be a source of metadata. Sections 5.2, 5.3 and 5.4 established the reasons for constructing a thesaurus, the characteristics of a thesaurus and how it should function. Section 5.5 will describe the process of construction of the WELLNESS thesaurus.

5.5 PROCESS OF WELLNESS THESAURUS CONSTRUCTION

The WELLNESS thesaurus that was constructed is an indexing and searching tool for providing access to the WELLNESS resources. The identification and comparison of the stages/steps involved in the process of thesaurus construction was undertaken to determine the stages required for the
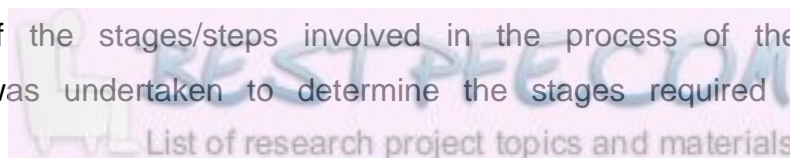
construction of the WELLNESS thesaurus. The completion of these stages would ensure that the WELLNESS thesaurus developed would meet the characteristics and functions of a thesaurus as described in sections 5.3 and 5.4.

Table 5.1 compared the stages/steps of the process of constructing a thesaurus as presented by Aitchison, Gilchrist and Bawden (2000:145-168), Broughton (2006:58-197), Marshall (2005:120-124), Morville (2003) and Soergel (1974:24-31).

Table 5.1 Comparison of stages/steps of thesaurus construction process

Stages/ Steps	Aitchison, Gilchrist, Bawden (2000:145-168)	Broughton (2006:58-197)	Marshall (2005:120-124)	Morville (2003)	Soergel (1974:24-31)
1	Definition of subject field to establish boundaries of field	Vocabulary collection and control (gathering the vocabulary - includes selection of terms & form of entry)	Define the vocabulary according to user information needs with reference to content, target audience, implementation and maintenance	Gather terms from as many sources, e.g. users, subject experts, content, existing thesauri	Collect and record material, i.e. terms, concepts, relationships among them, e.g. indexing languages, tables of contents, indexes, abstracts, lists from experts, search requests
2	Selection of thesaurus characteristics and layout. Consider the requirements of the system, how the thesaurus will be presented, how it will serve the needs of a database	Term extraction from document titles	Create controlled vocabulary. Refer to authorities, subject experts, web site log files. Create a synonym ring and an authority file.	Defining the preferred terms. e.g. decide on medical terminology or regular English. Define terms	Sort into alphabetical order, merge information on identical terms on one card.
3	Notify intent (in a professional journal)	Vocabulary analysis (facet analysis and thesaural relationships)	Define relationships within the vocabulary. Create a taxonomy or hierarchical structure. Add associative relationships.	Link synonyms and near-synonyms, abbreviations, spelling	Structure the thesaurus by determining hierarchical and associative relationships, clarify homonyms and synonyms. Select a preferred term. Hierarchy building should be oriented towards searching. Arrange concepts in a logically, coherent structure. Have an overview of the discipline.
4	Deductive (collect enough terms to find structure and to introduce vocabulary control) versus inductive method (submit terms to thesaurus and use as indexing). Apply vocabulary control, allocate terms to broader categories.	Introducing internal structure (order within arrays and between arrays)	Decide on a display format, browsing list or strategy for implementing the controlled vocabulary into a search function	Group preferred terms by subject in a hierarchy. Compare top-down to bottom-up content analysis	

Stages/ Steps	Aitchison, Gilchrist, Bawden (2000:145-168)	Broughton (2006:58-197)	Marshall (2005:120-124)	Morville (2003)	Soergel (1974:24-31)
5	Selection of terms, from terms in standardised form, from non-standardised terminology in literature, from users' questions and profiles. 5.1 Terminology sources standardised form: • Thesauri - lists of terms • Classification schemes • Encyclopaedias, lexicons, dictionaries, glossaries • Terminology databanks 5.2 Literature scanning for non-standardised, free-text terms. 5.2.1 Manual selection on cards to note number of times term occurs to indicate relative importance 5.2.2 Automatic term selection using computer from title, abstracts, text of documents noting frequency for grouping and relationships. 5.3 Question scanning using user queries from organisations and user profiles. 5.4 Users'/experts experience & knowledge 5.5 Compiler's experience & knowledge	Imposing hierarchy (hierarchies in different facets)	Evaluation of final product	Identify broader and narrower terms. Compare with existing thesaurus in subject area	

From an analysis of the stages/steps identified above, the researcher determined the nine stages relevant to the construction of the WELLNESS thesaurus. This model of thesaurus construction is presented in Table 5.2. A summary of each stage is outlined. Sections 5.5.1 to 5.5.9 explain in more detail what each stage entailed as relevant to the construction of the WELLNESS thesaurus.

Table 5.2 WELLNESS thesaurus construction

Stages of construction	Process involved
1. Consider existing thesauri. Gather terms from as many sources, e.g. users, subject experts, content.	• Use of appropriate macro-thesauri as existing vocabularies to support choice of preferred and non-preferred terms e.g. sunlight and sunshine • Defining the preferred terms e.g. decide on medical terminology or regular English. Define terms.
2. Vocabulary collection and control (gathering the vocabulary - includes selection of terms and form of entry)	• WELLNESS acronym i.e. concepts of water, exercise, life in balance, relationships, nutrition, rest/relaxation, sunlight, fresh air and stress management as indexing terms • Surveyed users (annexure 1)
3. Term extraction from document titles.	• Systematic searches in catalogs and databases • Literature review • Identified terms from titles of documents • Discarded vague and very broad terms • Established noun phrases, and converted verbs to noun equivalents
4. Vocabulary analysis (facet analysis and thesaural relationships)	• Terms were categorised into 8 categories of WELLNESS (superordinate or top terms) • Concepts were grouped in these 8 categories • Internal structure introduced into each facet to identify thesaural relationships (USE, UF, BT, NT, RT)
5. Introducing internal structure (order within arrays and between arrays).	• Checked organisation to identify precise relationships • Developed vocabulary control • Sub-categories developed (facets) • Ordered terms within array • Attempted to make an exhaustive list by consulting thesauri, HE and MeSH
6. Imposing hierarchy (hierarchies in different facets)	• Identified any synonyms • Made policy decisions about preferred terms • Organised terms into arrays • Identified hierarchical relationships and displayed by indentation • Tested hierarchy by consulting an information professional
7. Compound subjects and citation order (order between facets, combining and locating terms)	• Systematic display presented in a taxonomy • WELLNESS concepts were used as general terms • Compound terms were selected according to thesauri consulted
8. Conversion of taxonomy to alphabetical format (editing the schedule, selecting the preferred terms, broader and related terms). Compare with existing thesaurus in subject area	• Preferred terms were selected • Preferred term put into lead position • Thesaural relations appended • Broader, narrower and related terms were marked up BT, NT and RT • Compared with HE and MeSH thesauri.
9. Creating the thesaurus records (presentation of the entries)	• Presented in standard thesaurus convention format • Sorted into alphabetical order and edited • Expertise of user and compiler was used

The model of stages provided the structure for the construction of the WELLNESS thesaurus. In the comparison of the various models, it was established that once a decision for a controlled vocabulary has been made consideration of existing relevant thesauri is an important starting point.

5.5.1 Stage 1: consider existing thesauri

Kirtland (1981:249) suggests that the method for standardising word lists of subject-related fields should include identification of a source or macro thesaurus. In this study, the possible sources to be used for this purpose included medical/health-related thesauri such as Medical Subject Headings (MeSH) and the thesauri of the Health Promotion and Education (HE) Database of the NCCDPHP, as well as other macro thesauri such as Education Resources Information Center (ERIC) and Library of Congress Subject Headings (LCSH) as recommended by the researcher (Steyn 1999) in the original study. Each of these macro thesauri were briefly introduced to describe its purpose, characteristics and functions. This helped to identify the advantages and disadvantages of each and to determine suitability for extraction of terms and use in the construction of the WELLNESS thesaurus.

5.5.1.1   *MeSH*

MeSH is the NLM's controlled vocabulary thesaurus that consists of sets of terms that name descriptors in a hierarchical structure that facilitates searching at different levels of specificity. The 22,997 descriptors are arranged in both an alphabetic and hierarchical structure, consisting of eleven levels. At the most general level there are broad terms such as 'anatomy' and at the more narrow levels there are terms such as 'ankle'. There are thousands of cross-references to assist in finding the most appropriate MeSH heading, for example, Vitamin C *see* Ascorbic Acid (NLM 1997).

MeSH is used by NLM for indexing articles from 4,800 biomedical journals for the MEDLINE/PubMED database. It is also used for cataloging books, documents and audiovisuals for this database. In order to describe the

content of the item, each bibliographic reference is associated with a set of MeSH terms. The thesaurus is continually revised and updated by staff subject specialists with knowledge and expertise from various areas of the health sciences. New terms are gathered as they emerge in the scientific literature and in research, then defined and recommended for addition in MeSH. Other specialised vocabularies are also consulted for term extraction.

MeSH is provided electronically in machine-readable form by NLM at http://www.nlm.nih.gov/mesh. PDFs containing the various hierarchies are available for printing.

The following are the different types of terms contained in MeSH:

- descriptors (main headings): these characterise the content
- qualifiers: are used with descriptors and facilitate ways of grouping together the relevant documents. The list of qualifiers appears following the list of new descriptors
- publication types: these characterise what the item is, namely the type or genre
- geographics: included continents, regions, countries, states
- entry terms or *see* references: synonyms or closely related terms that are cross-referenced to descriptors. These indicate that information related to one term will be found under a different term. They need not be synonyms of the descriptors to which they refer. Some terms, because of their narrow focus, may not be useful as subject headings. The entry vocabulary may be used interchangeably with preferred descriptors for searching PubMED. In the alphabetic listing, each descriptor is followed by one or more alphanumeric expressions (tree numbers) that give the position of the term in the tree structure.

Table 5.3 is an example of how MeSH publishes a key term. The example of health promotion is shown as it is a key term to be used in the indexing of WELLNESS health information resources.

Table 5.3 Health promotion

MeSH Heading	Health Promotion
Tree Number	N02.370
Tree Number	N02.421.726.507
Annotation	IM
Scope Note	Encouraging consumer behaviours most likely to optimise health potentials (physical and psychosocial) through health information, preventive programs, and access to medical care.
Entry Term	Health Campaigns
Entry Term	Promotion of Health
Entry Term	Wellness Programs
Entry Term	Promotional Items
See Also	Health Behaviour
Allowable Qualifiers	CL EC ES HI LJ MA MT OG SD SN ST TD UT
History Note	80
Unique ID	D006293

Because the vocabulary of MeSH is specifically medical and scientific in orientation, it is not possible to use it exclusively. It serves conventional and biomedical medicine well as this is its intent. Therefore, a thesaurus that was appropriate for health promotion, wellness and prevention had to be considered as a possible macro thesaurus.

5.5.1.2   *HE thesaurus*

The HE thesaurus 2004 has more than one thousand five hundred terms that are used to describe the literature and programmes in the following databases: Health and Education Database, the Prenatal Smoking Cessation Database and the Epilepsy Education, Management and Prevention Activities Database. The databases are produced by the NCCDPHP of the Centers for Disease Control (CDC). These databases can be accessed through the

Chronic Disease Prevention (CDP) Databases and the CDP File CD-ROM. These databases are also available online at http://www.cdc.gov/cdp.

The HE thesaurus results from the continuous and cumulative process of indexing terms for these databases. It is used for indexing and is therefore an authoritative list of terms that can be used in searching the databases listed above. The conventions and standards used in the construction of the thesaurus conform to the NISO standard and are approved by the American National Standards Institute.

Table 5.4 is an example of an entry of one of the terms to be used in the WELLNESS thesaurus as used by HE thesaurus.

Table 5.4 Exercise

LT	WEIGHT CONTROL
UF	.... WEIGHT REDUCTION
BT	.... DIET
	.... EATING DISORDERS
	.... RISK FACTOR INTERVENTION
RT	.... DIET

5.5.1.3   *Other macro thesauri*

ERIC was also evaluated because of its reference to the disciplines of the social and behavioural sciences. A search for the term 'wellness' is illustrated in Table 5.5.

Table 5.5 Wellness

Descriptor Details
using **Wellness** as a search criterion

Record Type: Main
Scope Note: Condition of physical and psychological well-being attained
          through deliberate pursuit of a healthy lifestyle (Note: Prior to
          Apr00, the instruction "Wellness Programs, USE Health
          Promotion" was carried in the Thesaurus)
Category: Individual Development and Characteristics
Broader Terms: Health; Well Being;
Narrower Terms: n/a
Related Terms: Counseling; Health Education; Health Promotion; Life Style;

	Mental Health; Physical Fitness; Physical Health; Stress Management;
Used For:	Wellness Programs;
Use Term:	n/a
Use And:	n/a
Add Date:	04/21/2000

Terms related to 'lifestyle' include behaviour, attitudes, beliefs, values, change, modification, choice etcetera. However, these terms and concepts are dealt with in HE and for simplification of the process these terms will be used from HE.

The use of LCSH was recommended by the researcher (Steyn 1999) in the original research as the database that was being considered for housing the WELLNESS resources (rational therapy) was to be made available in a database in the Helderberg College Library. The print format was available in the library and the users surveyed expressed a familiarity with this list of subject headings. LCSH, 30th edition 2007, is accepted as the worldwide standard and is maintained by the Library of Congress (LC). It provides an alphabetical list of all subject headings, cross-references and subdivisions in verified status in the LC subject authority file. LCSH is available both in print or electronically by subscription unlike MeSH which is made available electronically for free and is easily accessible. Together with this, the fact that the focus of LCSH is not particularly or specifically on health would complicate the selection of terms for the WELLNESS thesaurus.

A search for the term 'wellness' in LCSH resulted in Wellness USE Health. Table 5.6 illustrates the term 'health' in LCSH.

Table 5.6 Health

Health [R S D]
A773-790] [L S D]
ere are entered works on optimal physical, mental, and social well-being, as well as how to achieve and preserve it. Works on personal body care and cleanliness are entered under Hygiene. Works on muscular efficiency and physical endurance are entered under Physical fitness.
    UF Personal health

Wellness
BT Medicine
   Physiology
RT Diseases
   Holistic medicine
   Hygiene
   Well-being
SA subdivision Health under names of individual persons and families; also
   subdivision Care and hygiene under parts of the body, e.g. Foot--Care and
   hygiene; also subdivision Health and hygiene under classes of persons and
   ethnic groups; and subdivision Health aspects under subjects
NT Alexander technique [R]
   Animal health [R]
   Astrology and health [R]
   Cardiovascular fitness [R]
   Detoxification (Health) [R]
   Diet [R]
   Exercise [R]
   Health attitudes [R]
   Health status indicators [R]
   Longevity [R]
   Mental health [R]
   Nutrition [R]
   Physical fitness [R]
   Plant health [R]
   Presidents--United States--Health [R]
   Public health [R]
   Relaxation [R]
   Reproductive health [R]
   Rest [R]
   Rural health [R]
   Self-care, Health [R]
   Sleep [R]
   Stress management [R]
   Vitality [R]

A summary of the advantages and disadvantages of MeSH, HE, LCSH
and ERIC are compared in Table 5.7 so as to determine their suitability for
use for the construction of the WELLNESS thesaurus.

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Table 5.7 Comparison of MeSH, HE, LCSH and ERIC

Thesaurus	Advantages	Disadvantages
MeSH	• Covers medical field extensively • Emphasis on disease, biomedical approach • Specialised database/s of MLA • Comprehensive, gives details on entries, requires professional understanding and input • Terms clearly defined with scope notes • Scientific terms used • Online	• Limited coverage of health promotion • No emphasis on prevention and lifestyle • Very specialised • Format is not traditional and needs explanation. Not user friendly. • Scientese and use of medical terms rather than natural language
HE	• Orientation is to health promotion, prevention, lifestyle, risk and behaviour factors • Databases of NCCDPHP of the CDC • Traditional format of thesaurus • User-friendly • Online	• Limited number of databases • Relevant information from databases covered in MeSH not included so limited in scope • Not all terms have scope notes • Simplistic
LCSH	• Print format is available in most libraries • Library users are somewhat familiar with this list of subject headings	• Online but not public domain • Headings are complicated and scope notes are not given • Requires access to OCLC as the authority lists are there • Subdivision access requires professional training (subject cataloguer) as subheadings should be built from free floating subdivision • Moves away from MARC to XML which requires professional training • Unwieldy for anything but entry of bibliographic items • LCSH is not user-friendly, it requires professional input and cannot be used as a macro thesaurus on which to build a WELLNESS thesaurus
ERIC	• Focuses on social and behavioural sciences Terms related to 'lifestyle' and relevant to the WELLNESS thesaurus include behaviour, attitudes, beliefs, values, change, modification, choice	• An additional source but could complicate rather than simplify the selection of terminology as the focus is not on health

The purpose of considering existing thesauri was to identify whether a suitable thesaurus already existed from which to extract all the terms necessary for a controlled subject vocabulary, that is a controlled WELLNESS vocabulary. After it was established that no existing thesaurus could serve this purpose entirely on its own due to the specific terminology of the WELLNESS approach, the thesauri that were considered for extraction of relevant terms were compared. This was done to identify the most user-friendly, yet current, accurate, topical and relevant standardised list of terms that could be used to develop a thesaurus that was oriented to health promotion, wellness and prevention rather than one that was focused on medicine and disease. This process resulted in the researcher's selection of MeSH and HE as existing thesauri from which terms to be incorporated in the WELLNESS thesaurus would be extracted.

5.5.2 Stage 2: vocabulary collection and control

The WELLNESS approach identified in Chapter two and the WELLNESS framework outlined in Chapter four comprises eight components which together reflect a particular approach to health and wellness. The acronym WELLNESS reflects this approach to wellness and is used in this study. Each of the letters of the acronym WELLNESS represents a component of the WELLNESS approach and are as follows:

W – Water
E – Exercise
L – Life in proper balance
L – Loving relationships
N – Nutrition of a good quality and proper quantity
E – Enjoyment of adequate rest
S – Sunlight and fresh air
S – Stress management.

The eight components provided the basic vocabulary, as well as structure for the thesaurus and were key indexing terms upon which to build the WELLNESS thesaurus.

The HE thesaurus was selected as the main existing thesaurus to inform the structure of the WELLNESS thesaurus, which is included as Annexure two. An important reason for the selection of this particular thesaurus was that it best suited this approach to wellness and accommodated key terms of the WELLNESS approach. MeSH terms were extracted when the HE thesaurus did not provide a term that was suitable or appropriate or when there was lack of a term. When neither of these two thesauri provided an appropriate term, the researcher established suitable terms for inclusion based on a literature analysis, her knowledge of the WELLNESS approach, and from terms supplied by users in the original research (Steyn 1999).

5.5.3 Stage 3: term extraction from document titles

Once the basic structure and vocabulary for the WELLNESS thesaurus was outlined based on the eight components of the WELLNESS approach the researcher then undertook searches in online catalogues, databases and web sites related to health and wellness to further inform the construction of the thesaurus in terms of its structure and vocabulary. Literature reviews and the identification of terms from the titles and contents of relevant health- or WELLNESS-related sources aided in term extraction and informed the construction of the structure of the thesaurus. These analyses identified relationships between terms used in the WELLNESS context. Broader terms, narrower terms, related terms, preferred terms, non-preferred terms, etcetera were identified. Vague and broad terms were discarded and verbs were converted to noun equivalents to consistently use noun phrases in the controlled vocabulary.

5.5.4 Stage 4: vocabulary analysis

The eight components of WELLNESS were identified as the superordinate or top terms. Terms relating to these superordinate terms were categorised into the respective component. A combination of two methods was used for vocabulary analysis and construction in this study. Firstly, a representative set of entities was indexed to establish and confirm or modify the list of terms suggested by the users in the original research (Steyn 1999). Secondly, reference was made to glossaries, publications, back-of-the-book indexes, subject bibliographies and subject specialists to, as Lancaster (1972:27-28) states, verify the preferred terms and establish any neglected, yet relevant terms.

Each term to be included in the thesaurus was negotiated on an individual basis. The process of negotiating a term involves the question of natural language, usability and the user. Natural language has to do with those terms used by authors in lifestyle and prevention literature and with those terms with which the user is familiar. Ironically, the term should not originate in a thesaurus as it should be considered in a form that is user-friendly. However, it should be listed in a controlled vocabulary in order to reduce duplication, redundancy and the use of random terms that are too specific with only one possible entry, all of which contribute to chaos and the inability to search effectively. The term should be indexable, that is it describes the information in the context of the system and that it has an unambiguous, identifiable meaning. A question about its structure relates to whether the term should be an identifier, cross-referenced or a descriptor. If the meaning is not clear then a more explicit term should be identified. If several meanings are identified, then these should be distinguished by means of the semantic context or by grammatical form. Plural may establish the 'thing' and singular the process. The term should be assessed according to the group to which it really should belong. Relationships between terms should be considered. Inclusion of a term in the thesaurus should stimulate reflection on any other potentially relevant terms. Reference to the macro thesauri supported this negotiation process. The findings reported in Steyn (1999) also informed this process.

The thesaurus has not yet been tested or applied and therefore the possibility of inclusion and/or exclusion had to be taken into consideration. The rules developed had to therefore be applied with flexibility. This is true of most thesauri. The date of change of term, addition of a new term, as well as the date of updating is often published to reflect development.

5.5.5 Stage 5: introducing internal structure

The terms selected were grouped according to the components of WELLNESS and the internal structure introduced to identify relationships (USE, UF, BT, NT, RT). Sub-categories were developed (facets) and the organisation checked to identify precise relationships. The terms were ordered within arrays. Attempts were made to have an exhaustive list by comparison with HE and MeSH.

5.5.6 Stage 6: imposing hierarchy

In this stage of the construction of the WELLNESS thesaurus, synonyms were identified, a policy decision was made about preferred terms and the terms were organised into arrays. Hierarchical relationships were identified and displayed using indentation. Vocabulary was controlled by choosing preferred terms from among a group of terms with similar meanings. *Use* and *UF* references were used to direct both the indexer and the searcher to the preferred term. A *UF* reference is made to control the use of synonyms, near-synonyms and quasi-synonyms. *Use* directs the indexer or searcher to the preferred term from the non-preferred term.

The researcher consulted with an information professional to ensure that the structure and hierarchy imposed for the WELLNESS thesaurus made sense and would work. The information professional tested the hierarchy and offered advice and suggestions.

5.5.7 Stage 7: compound subjects and citation order

In this stage of the construction of the WELLNESS thesaurus, the terms chosen for incorporation in the thesaurus were systematically displayed in a taxonomy. WELLNESS concepts were used as general terms. Compound terms were selected according to the thesauri consulted. MeSH provided terms for inclusion that were not found in HE. To simplify the intricate rules that govern the relationships in MeSH vocabulary, those terms that were not listed in HE were selected from MeSH and combined into a structure and format similar to that of the HE.

5.5.8 Stage 8: conversion of taxonomy to alphabetical format

Stage 8 converted the taxonomy to an alphabetical format. These terms were then considered according to the relationship to each other and to the broad terms considered as superordinates in the hierarchy. Examples of alphabetic display, descriptors, hierarchies, term relationships, vocabulary rules, term display and scope notes to evidence the process of thesaurus construction are given below.

5.5.8.1   *Alphabetic display*

The display will be alphabetic with each term in its hierarchic cross-reference structure, for example:

Thesaurus term		Health behaviour
Used for	UF	Personal health practices
Broad term	BT	Lifestyle
Narrow term	NT	Alcohol use
		Diet
		Drug use
		Exercise
		Screening behaviour
		Self care
		Self examination
		Self treatment
		Tobacco use (1991 – introduced in 1991)
Related term	RT	Abstinence
		Active life expectancies
		Adherence (behaviour)

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Cardiovascular risk factors
Eating behaviour
Health beliefs
Health service utilisation
Health values
Hygiene
Initiation of behaviour (1994)
Knowledge behaviour gap
Locus of control

5.5.8.2 *Descriptors*

Because of the particular focus of this database-driven web site, all descriptors relate to WELLNESS and its subordinate terms as can be seen in Annexure two.

5.5.8.3 *Hierarchies*

The WELLNESS thesaurus will more closely reflect the hierarchical structure of HE than MeSH. There may however, be new and different hierarchical and associative term relationships.

5.5.8.4 *Term relationships*

Cross-references are used to specify the following:

- term may be used as a substitute for other closely related words or may be a synonym for other words
- term may be broader in concept than some terms and narrower than others
- term may have nonhierarchical relationships with other terms.

Table 5.8 defines term relationships.

Table 5.8 Term relationships

SN	Scope note	Explains or defines a term
USE	Use	Directs the user to a preferred term from a non-preferred term

UF	Used for	Indicates a non-preferred term for which a substitute has been assigned
BT	Broader term	Indicates the class of concepts to which the term is a member. It implies genus-species relationship
NT	Narrower term	Identifies the term as a member of a class of concepts. It is the reciprocal of the BT reference
RT	Related term	Identifies other terms that may be of interest to the user. These terms are being used. In general any 2 terms that may bear this reference if it is thought that the user, when examining one term, might want to be reminded of the fact that the other term exists.

For example, health behaviour (preferred term) is used for personal health practices (non-preferred term). The broader term for health behaviour is lifestyle. Related terms include abstinence, health beliefs. Narrower terms include diet, and exercise.

5.5.8.5   *Vocabulary rules*

The rules governing terminology are more closely related to HE than to MeSH. Broad terms have been identified with reference to the superordinate, subordinate and coordinate concepts of WELLNESS. Examples of superordinate and subordinate concepts are shown in Table 5.9.

Table 5.9 Superordinate and subordinate concepts

Wellness NT Health	Water NT Baths	Exercise NT Aerobic exercise	Life in balance NT Abstinence

5.5.8.6   *Term display*

Term includes broader and narrower terms as well as related terms.

ABSTINENCE
BT   Life in balance
RT   Addiction
        Adjustment (HE)
        Alcohol use
        Attitude change (HE)
        Cardiovascular risk factors (HE)
        Coping (HE)
        Depression (HE)
        Drug use
        Empowerment (HE)
        Health behaviour
        Human sexuality

Independent living (HE)
Laughter (MeSH)
Laughter therapy (MeSH)
Mental illness (HE)
Psychological factors (HE)
Psychosocial factors (HE)
Self efficacy (HE)
Sex behaviour
Temperance (MeSH)
Tobacco use
Wit and humor (MeSH)

5.5.8.7   *Scope notes*

When MeSH terms are selected, scope notes are not used, but translated into used fors (UF) and related terms (RT). HE assumes that the standard dictionary definition of a term should suffice as the denotation of that term. For continuity, any terms that may need defining will be recorded with scope notes.

5.5.9. Stage 9: creating the thesaurus records (presentation of the entries)

The process of display was then initiated and the WELLNESS thesaurus presented in the standard, conventional thesaurus style as Annexure two. The terms were sorted into alphabetical order, edited and formatted.

U.S. (NISO Z39.19-2005) and British (BS 8723-1&2:2005) standards for thesaurus construction are available for use. The researcher consulted the U.S. National Standard developed by NISO (2005) as it provided guidelines for the construction, format and management of monolingual controlled vocabularies.   These standards were considered and applied in the construction of the WELLNESS thesaurus.

Vocabulary control and the development of a thesaurus is an on-going process which has to be continually evaluated against the information and resources collected in the specific area of knowledge and taking into consideration the users' requirements (Aitchison, Gilchrist & Bawden 2000:169; Broughton 2006:197; Milstead 1998; Pao 1989:128).   The

researcher will recommend in Chapter eight that ongoing identification of relevant terms and evaluation of the thesaurus should take place in order to facilitate the WELLNESS health information seeker search, browse and retrieval activities.

The WELLNESS thesaurus will provide standardisation hereby ensuring consistency for the terms/descriptors, which is very similar to the function of an authority list such as that used for an author or a publisher. This will facilitate the search process and ensure consistency, standardisation and control of WELLNESS terminology, a requirement stipulated by the user in the original research (Steyn 1999).

5.6 CONCLUSION

The choice and use of the thesaurus as an indexing tool to facilitate information representation and retrieval was the focus of this chapter. The characteristics and function of a thesaurus were discussed to inform the construction of the WELLNESS thesaurus. A model of nine stages of thesaurus construction was used to explain the process of construction. The resulting WELLNESS thesaurus is included as Annexure two. Although the thesaurus has been constructed with the goal of facilitating effective searching and supporting the development of a web site that is usable and user-friendly, it cannot be set in concrete. The process of thesaurus construction is dynamic. As research continues to grow, as knowledge and understanding shifts, new terms will develop and some terms will become obsolete. These should be considered for inclusion or exclusion from the thesaurus. A web site with quality information requires that the information professional should remain informed and the information should be current.

Chapters six and seven will discuss the database design and the web site design, two other important aspects of the development of the tool to facilitate WELLNESS information representation and retrieval.

CHAPTER SIX

DATABASE DESIGN

6.1 INTRODUCTION

This chapter discusses the database design of the database-driven web site. Previous chapters focused on the 'user' (chapter 3) and the 'resources' (chapter 4). This chapter focuses on the database aspect of the 'tool'. The phenomenal growth and preferred use of the Web by the health information seeker as the medium for accessing health information was established in Chapters two and three. The Web is regarded to be the most useful in enabling the user to access resources intended to promote a healthy lifestyle. Based on this phenomenon, the researcher made the decision to change from the design of a software-based database, as researched in Steyn (1999), to a database-driven web site as 'tool'. Chapter five discussed the construction of the WELLNESS thesaurus, the first aspect of the 'tool'. Chapter seven will focus on the web site aspect of the 'tool'.

Identified database host options were compared according to a set of criteria. Based on this comparison, a choice of host was made. Reasons are given for the selection of CIRCLE as host. The conceptual schema, including the E-R diagram and data dictionary, which were developed by the researcher (Steyn 1999:144-171) and set out in Annexure one, were assessed according to the specifications of CIRCLE. This was necessary to determine whether the conceptual schema could be mapped to CIRCLE, the identified host. Recommendations for modification emerged in this process.

6.2 DATABASE AND REFERENCE DATABASE

The term 'database' was defined by the researcher (Steyn 1999:67) as follows:

- "a store or a collection of related data (or information), representing some aspect (e.g. entities or information about entities/descriptions of entities) of the real world

- designed for a specific purpose (e.g. to meet the information needs of a specific organisation, individual user, to solve problems or to answer questions and make decisions)

- designed to logically organise data/information to simplify retrieval and maintenance

- consists of entities (or information about entities), their attributes and the relationships amongst the entities

- describes entities consistently

- use the facilities of computer hardware and software to enhance the retrieval and storage of information".

The use of a database facilitates the collection, organisation, representation and relationships between entities. It is designed for a specific purpose - that of meeting user needs. A database also facilitates searching and retrieval, and easy maintenance. It provides consistency and logically organises content.

As discussed by the researcher (Steyn 1999:70), a reference database refers or points the searcher to the original, actual sources of information. It may be focused in subject coverage, but inclusive of a wide range of formats. Details included range from minimum details required to trace the document to lengthy abstracts or summaries included with the basic reference, as well as subject descriptors, etcetera. Searching a bibliographic or reference database produces document records or the surrogate of a document, not the documents themselves.

Originally the conceptual schema, consisting of the E-R diagram and data dictionary, were developed by the researcher (Steyn 1999) with the intention of developing a software-based reference database accessible locally at Helderberg College in South Africa. A recommendation was made by the

researcher (Steyn 1999:189) to investigate the possibility of making the database available on a wider scale on the Web. The nature of the Web and its linking capabilities facilitates access to the actual documents, in particular full-text of documents, expanding the capabilities of the reference database.

Chapters two and three highlighted the use of technology, especially the Web, in the current health care situation to provide access to health information resources. The increased use of the Web by the health information seeker, as well as the information explosion and need for health information to make informed lifestyle choices, precipitated the need for refinement and expansion of the database from a software-based to a Web-based database. This will ensure a global audience as opposed to a local audience. It will impact the epidemic of chronic disease by making health information available on a global scale. The researcher had to adapt from a choice of software to a choice of host for the database within this milieu. As a result an implication of this is that a mapping of the database design to the database host was required with the researcher matching the characteristics and constraints of the conceptual model to the selected database host. A web site to be the interface between the user and the database should be designed. The design of the web site is the focus of Chapter seven.

The accelerating use of the Web by WELLNESS health information seekers supports the identification of the most suitable database host for providing access to WELLNESS resources.

6.3 CHOICE OF DATABASE HOST

Before an analysis of the conceptual schema and its relation to and suitability for the database host could be undertaken in section 6.4, it was necessary to compare host options. A host is necessary to house the database. The Web interface communicates with the database through the web server to return the results of a user query to the web site. Possible host options included Seventh-day Adventist academic institutions, their library or health promotion or wellness programmes/departments; organisations that advocate the

WELLNESS approach such as lifestyle institutes; an independent host not connected to any specific institution or organisation; or an organisation supported by the Seventh-day Adventist organisational structure. Using a set of criteria (0=no; 1=somewhat; 2=yes) in Table 6.1, three options were compared to identify the one most suitable for further analysis. Of the options identified, the following three were selected: independent database host, Southern Adventist University (SAU) and CIRCLE. These options will be further discussed below.

Table 6.1 Comparison of database host options

	Independent Database Host	SAU	CIRCLE
SDA Health Worldview	2	2	2
WELLNESS approach	2	2	1
Credibility:			
Association with higher education institution	0	2	2
Connected to academic library	0	2	1
Existing database-driven web host	0	0	2
Reciprocity	0	1	2
Database technology	1	1	2
Programmers/resources	1	1	2
Finances	1	1	1
Familiarity with organisation	0	2	2
Priority rating total	**7**	**14**	**17**

6.3.1 Independent database host

The ideal option would be to have total control and independence in design, development, implementation and maintenance of a web-based database. This would include full control over data elements, design of the backend programming and functionality, the searching capabilities provided to the user, the content of the web site and the expansion of the web site to include other services and content. This would eliminate the need for partnership with other

organisations and persons. The researcher would be solely responsible for all aspects of the project. A disadvantage of this option is that a large outlay of funding and expertise in all areas of information technology (IT) would be necessary. At this time, this is not an option available to the researcher. An independent option would also raise concern regarding credibility.   Having total independence would mean that the researcher would be responsible for set up of the whole infrastructure. The researcher would:

- choose an Internet service provider (ISP) capable of handling the volume and scope of project, be it a commercial service provider or own
- establish the computer network and server set up
- have extensive information technology expertise
- be responsible for the choice of and implementation of computer hardware, software and platform such as Postnuke, Zope, Oracle, etcetera
- be skilled in all aspects of programming to develop the database-driven web site
- hire a programmer/s to develop and implement the database-driven web site
- be skilled in web design or hire a web designer
- hire, train and manage data entry personnel
- establish backup and recovery protocols
- obtain and manage funding
- be responsible for security
- publicise and market the web site
- continually update the web site and content.

6.3.2 SAU

SAU is a potential host. It is a SDA liberal arts university. The university has an active wellness programme in which faculty, staff and students participate voluntarily. The importance of lifestyle and wellness are emphasized by the

university administration. Incentives are provided for those who contribute to improving their health and making lifestyle choices. Although there is an emphasis on lifestyle choice and wellness at the university, the researcher would still need to be cognisant of the constraints imposed by aligning a database-driven web site with the university. Proximity and familiarity with the infrastructure and personnel makes SAU the most logical option within the SDA academic institution category of potential hosts.

Information technology constraints and university guidelines for web site development would be issues to consider. The researcher would have to develop the infrastructure within the constraints imposed by the university and information technology department. The database would have to be developed, the code written and the searching and querying capabilities developed and written. The researcher would have to possess these skills or, as in the independent option discussed above, hire individuals with the necessary skills. The project would require funding and publicity, as well as information technology help and support. As with the independent option, appropriate hardware and software would have to be purchased, installed and maintained. Network space and bandwidth would have to be negotiated. Working within the university infrastructure would involve more layers of bureaucracy, with parameters within which to work as set by the university. This could lead to limitations on the service offered and expansion capabilities sought. Maintenance of the site may become a problem if the arrangement between the university and the researcher was to change in any way.

6.3.3 CIRCLE

CIRCLE is the SDA clearinghouse for curriculum and other instruction resources. It is an established SDA entity sponsored by the North American Division Office of Education, managed through the Andrews University School of Education, and hosted by Walla Walla University. The mission of CIRCLE is: "to serve as a comprehensive source for locating the ever-expanding array of resources for SDA educators as they continue the teaching ministry of Jesus Christ" (CIRCLE 2007). A management team, comprised of the

Director of Operations and Director of Technology, oversee the day-to-day operations of the CIRCLE web site. The CIRCLE Executive Board has seven members. The CIRCLE Advisory Board consists of the Executive Board members, as well as SDA World Division Education Directors.

In discussion with the Director of Operations, it became evident that CIRCLE was a potential host with mutual benefits. CIRCLE continually strives to enhance their services to SDA educators and strategically aims to expand the resources they offer and include educational materials in other subject areas such as health.

Forming a partnership with CIRCLE and working within the CIRCLE infrastructure would provide:

- a partnership with an established and supported entity
- funding for backend operations
- publicity and marketing channels
- a shared educational philosophy focused on the provision of resources
- programming and technical support
- an established database structure
- a search engine
- a data entry interface
- an established mechanism for community participation in resource suggestion
- hardware support
- up-to-date software
- security
- regular link verification.

The researcher would have to work within an already developed database structure and assess whether the E-R diagram and data dictionary would fit in this structure. CIRCLE has a powerful front-end with search capabilities which will provide user access to WELLNESS resources. CIRCLE has a

Director of Technology who programs the back-end of the database and can modify the database structure to accommodate the researcher's needs. Any modifications that would need to be made to these aspects of the conceptual model and schema would be done during the development stage. The Director of Operations oversees the web site and the Executive and Advisory Boards provide support and other services. CIRCLE already has a web presence enabling the researcher to tie in with this service, with free linking to health resources provided.

In an interview with both the Directors of Operations and Technology (Bradfield & Duncan 2006), scenarios of how the WELLNESS web site could be incorporated into the current CIRCLE infrastructure were discussed. The three scenarios are:

- scenario one: total inclusion in the CIRCLE web site expanding the current health subject area using the CIRCLE web site design, data and search results structure
- scenario two: use own web site hosted on CIRCLE server to provide the user interface and use CIRCLE search engine and database for input, storage and retrieval of entities with changes to the database structure to match the conceptual schema
- scenario three: host own web site on own server with CIRCLE hosted customised database using CIRCLE search engine but display of results in own format. The Director of Technology would have to perform additional programming tasks to enable this option. Search results would be passed back to the front end interface via Extensible markup language (XML) allowing greater customisation of search results screen.

Scenario one is problematic in that the health resources collected by CIRCLE focus on educational resources for use by educators from kindergarten to grade 12 (K-12) in their teaching. The goal of this study is the development of a reference database of health information resources to facilitate informed lifestyle choice by the WELLNESS health information seeker. The goal is to

find and make available WELLNESS resources to a wider audience than merely K-12 educators. Scenario three would necessitate a large investment of time by the CIRCLE Director of Technology and the researcher, as well as requiring an outlay of funding. Scenario two allows for flexibility and customisation as well as integration with CIRCLE. CIRCLE would be able to utilise the resources added to the WELLNESS database. It would assist in their expansion to provide resources to higher education. Any additions to the CIRCLE database structure to map the conceptual schema would be done by the Director of Technology in consultation with the researcher.

Of the three options discussed above, option three - that is working within the CIRCLE infrastructure - seemed to be the logical choice. The researcher does not have the required infrastructure to facilitate an independent host (option 1). The constraints of the SAU option (option 2) would not be that much different from that of an independent host option. The researcher therefore assessed the E-R diagram and data dictionary in the context of the CIRCLE database to establish whether CIRCLE was the host that would be the most appropriate for conceptual schema integration and further development. This is an iterative process that requires continual dialogue with the Director of Technology to make necessary modifications to the database structure until the final implementation of the database-driven web site takes place. This is not part of this study, but will be discussed as a recommendation in Chapter eight.

When assessing the conceptual schema, the researcher must take cognisance of user needs and the types of query put to the database and the subjects covered by queries. The discussion that follows is an assessment of the conceptual schema and its appropriateness for the database host, CIRCLE.

6.4 ASSESSMENT OF CONCEPTUAL SCHEMA

The conceptual schema was developed by the researcher in the original research (Steyn 1999). The data dictionary is presented in Annexure one as

Tables 5.1-5.26 and Figures 5.1-5.16. An E-R diagram (Steyn 1999:159), presented in Figure 6.1 represented the entities, composite entities and the relationships among entities. The E-R model and the data dictionary represents the attributes of entities and illustrates relationships.
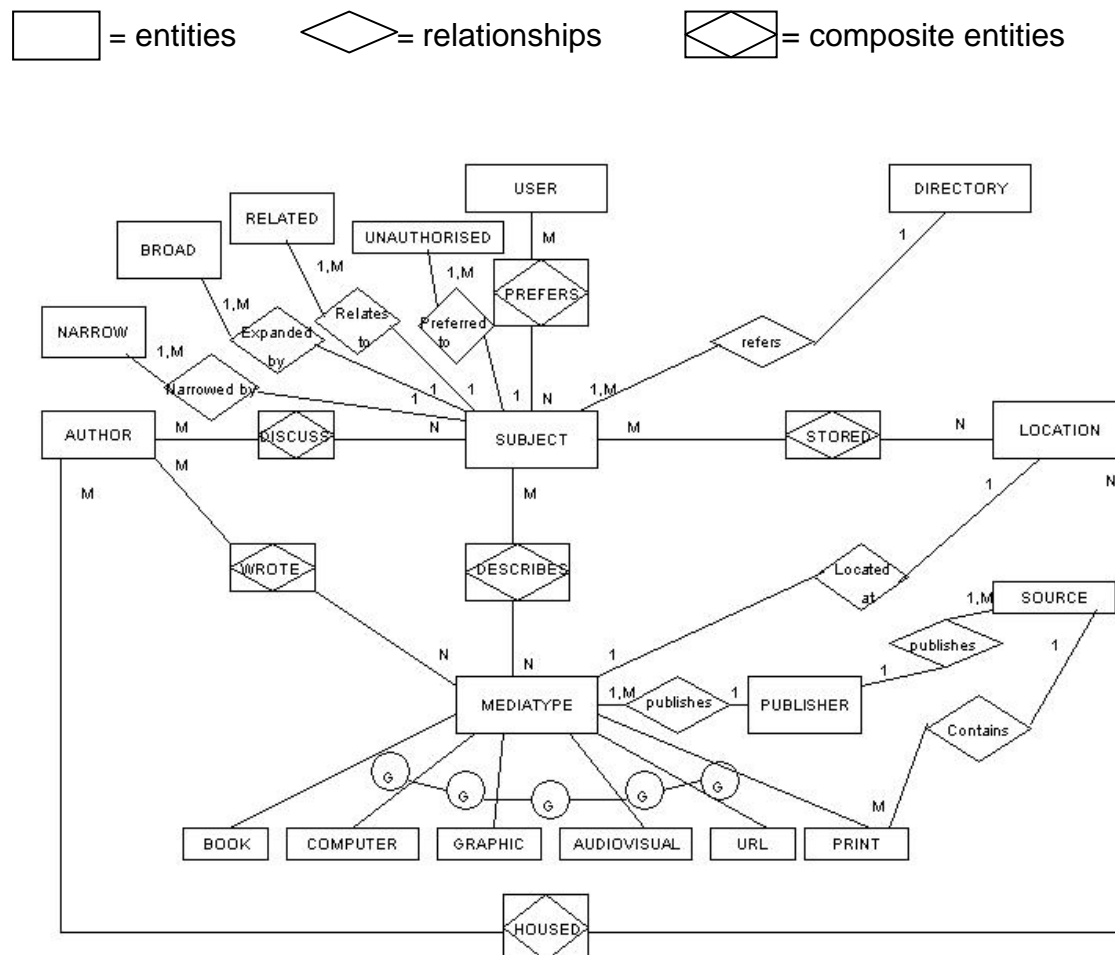
Figure 6.1 E-R diagram for rational therapy database

In discussion with the CIRCLE Directors of Operations and Technology (Bradfield & Duncan 2006) and the researcher's assessment of the CIRCLE database, almost all of the elements of the E-R model and data dictionary were evident and compatible with the CIRCLE data structure. Where significant elements were absent from the CIRCLE database, but necessary to meet the specifications of the E-R diagram for this study, there was agreement that these will be accommodated by the CIRCLE Director of Technology according to the researcher's specifications. The CIRCLE

database, as the platform for, and back-end to the CIRCLE web site, is believed to be compatible and congruent with the needs of a health information web site and this study.

Within the CIRCLE option of database hosts, scenario two focused on the use of the researcher's own web site hosted on the CIRCLE server to provide the user interface. CIRCLE's search engine and database would be used for input, storage and retrieval of entities. Changes would be made to the database structure to match the conceptual schema.

A summary of the administrative module of CIRCLE is discussed and illustrated below with screen shot examples from CIRCLE. The administrative module allows for the management of entities and resources. CIRCLE administrators log in to the Administration page, shown in Figure 6.2, using a username and password. Different administrative options are listed.

Figure 6.2 CIRCLE Administrative Options

The 'Resource Management' option allows for the management of CIRCLE resources. This would allow for WELLNESS resource management. The 'Resource Management' option, shown in Figure 6.3, allows the administrator to administer a variety of options, namely add/edit records; manage publishers; manage languages; manage the tree; manage resource types; manage audiences and unapproved resources.
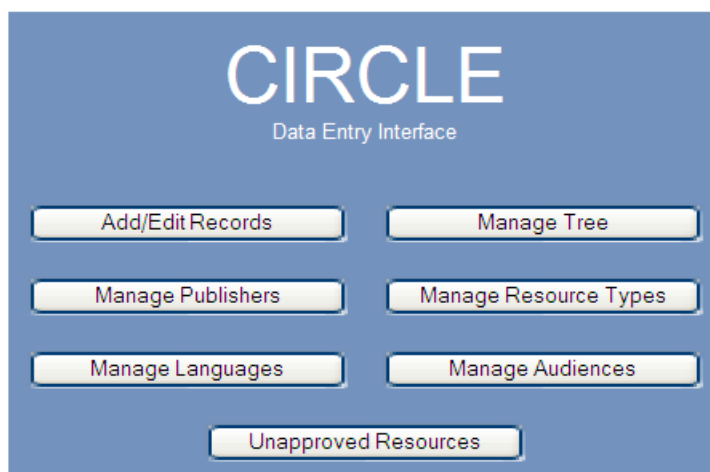
Figure 6.3 CIRCLE Data Entry Interface

The 'Add/Edit Records' option on the Data entry interface, shown in Figure 6.4, allows the administrator to add or edit records. Fields available for input are resource ID, resource title, publisher, publication date, URL, and submitter info field. An important consideration in assessment of the conceptual schema was whether CIRCLE could accommodate the entities as represented in the E-R diagram, Figure 6.1. The E-R diagram is comprised of the user entity, subject entity, related entity, broad entity, narrow entity, unauthorized entity, mediatype entity, location entity, publisher entity, source entity, directory entity, author entity, wrote entity, stored entity, discuss entity, describes entity, prefers entity, housed entity. These entities are set out in Annexure one. Editorial fields, authors, keywords, resource type, audience, subjects & topics, submitter info, and languages are additional CIRCLE data entry/edit options. Any unused fields in a record would not display on the CIRCLE results page. Therefore any fields not relevant to the WELLNESS database such as grade level or classification will not display on the

WELLNESS results page. Audience and languages are not particularly relevant to the WELLNESS database at this time, but could prove useful with expansion over time. Resource types correlate with mediatype.

Figure 6.4 CIRCLE Add/Edit Records Option

The location entity was very important in the original research (Steyn 1999) with regards to the accessibility and retrieval of health materials in that particular situation. With the expansion and use of the Web, location is deemed less important because of the linking capabilities provided by use of the Internet. URLs can be provided which provide access to library holdings, book vendors, full-text articles, etcetera. A comparison of fields indicates that the CIRCLE database will meet almost all of the requirements of the conceptual schema. 'Resource types', shown in Figures 6.5 and 6.6, correlate with mediatype and additions to the existing CIRCLE list can be made to facilitate WELLNESS resource types.

Figure 6.5 CIRCLE Manage Resource Types

Figure 6.6 CIRCLE Resource Type Modification

Figure 6.7 shows the unapproved resource list which allows for quality control, verification and edits to resources added to the database. If there are several submitters/data entry personnel, this feature allows the approver to manage the records. Authority control is lacking in the context of bibliographic control. This issue was discussed with the Directors of Operations and Technology.

Figure 6.7 CIRCLE Unapproved Resource List

The publisher entity, as set out in Annexure one, Table 5.19, correlates closely with the CIRCLE publisher entity shown in Figure 6.8. The researcher discussed publisher authority control with the CIRCLE Directors of Operations and Technology and will work with them in establishing stricter publisher authority control rules.

The researcher, in discussion with the CIRCLE Directors of Operations and Technology (Bradfield & Duncan 2006), concerning the control of authors as shown in Figure 6.9, determined that work will have to be done on author authority control.

Figure 6.8 CIRCLE Publisher Entry

Figure 6.9 CIRCLE Authors

Additional information about authors to match the author entity requirements as set out in Annexure one, Table 5.18, will be accommodated by the Director of Technology.

The researcher (1999:146) determined that the most important entity identified by users was subject. Indexing, vocabulary control and thesaurus construction are associated issues. Related, narrower, broader and unauthorized terms become important to guide the user in the search process and have an important bearing on user friendliness. Figures 5.4, 5.5, 5.8, 5.9-12, 5.14-5.15 and Tables 5.5-5.9, 5.22-25 in Annexure one show the relationship and data dictionary information for subject. The construction of a WELLNESS thesaurus facilitates access to the WELLNESS resources as was discussed in Chapter five, section 5.5.
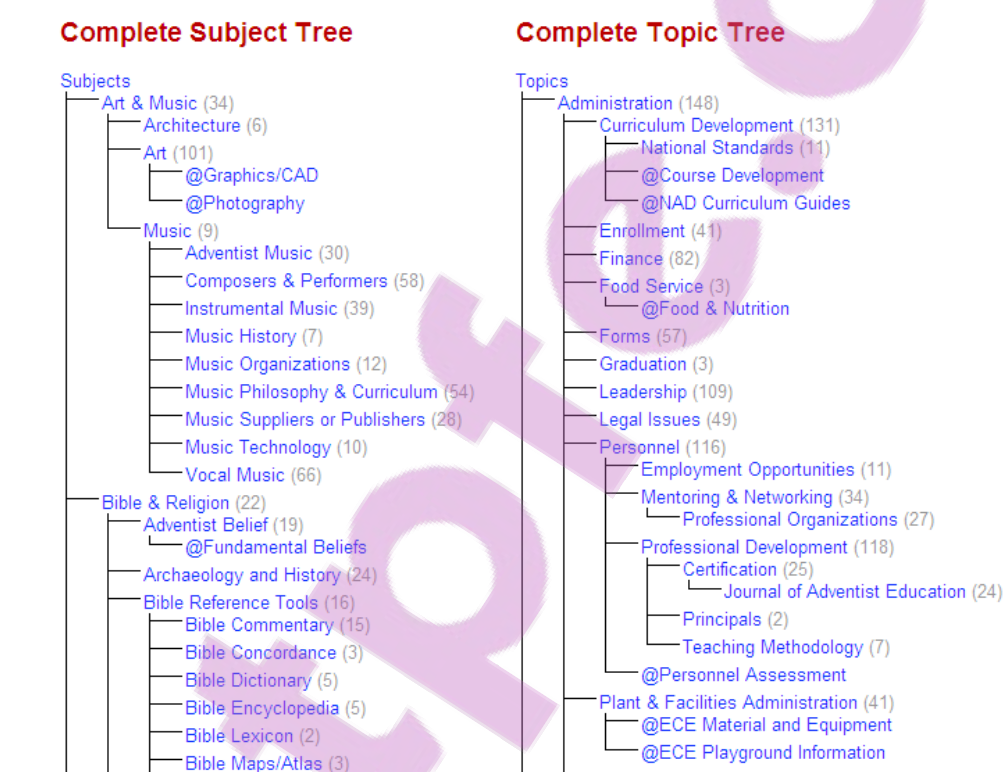
Figure 6.10 CIRCLE Complete Subject & Topic Tree

Figure 6.10 shows the CIRCLE subject and topic tree. CIRCLE provides subject, topic and keyword access to resources. Subjects included in the tree are the school subjects taught K-12 and at the tertiary level, for example art and music, bible and religion. Topics are those subjects which are related to education, but which do not fall into the category of subjects taught in school, for example leadership, administration and educational technology. Keywords allow greater access to the resources. Subjects, topics and keywords are

chosen on the premise that the title of the resource guides the indexer in the choice of the subject descriptors and topics. Main subjects and topics are further chosen by determining the main focus of the resource. Keywords help to describe the resource and can be used to index something noteworthy, but are not the main focus of the resource. Nodes and parent nodes are established in the tree management input screen as shown in Figure 6.11. Cross references are shown by the @ sign on the category tree.
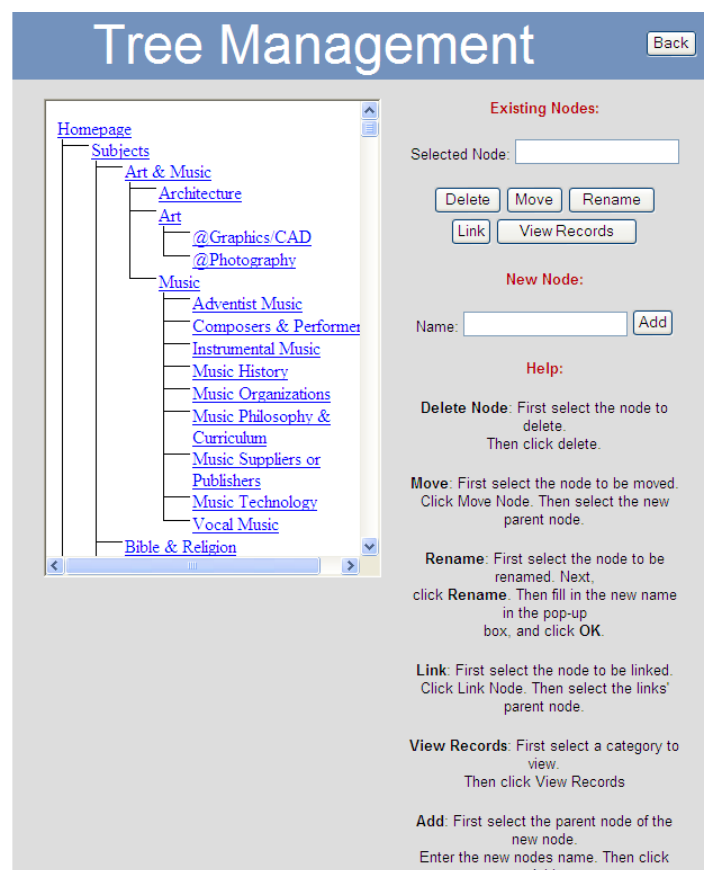
Figure 6.11 CIRCLE Tree Management

At the inception of CIRCLE, the subject and topic management was manageable and simple. With the expansion of the database and web site over time, subject and topic management has become unwieldy. Failure to document and construct a thesaurus at inception has resulted in a reactive rather than proactive approach to subject management. Duplication of effort, lack of consistency and standardisation in terminology has resulted in the Director of Operations spending large amounts of time trying to deal with the situation. During the interview with the CIRCLE Directors (Bradfield & Duncan

2006), the researcher described the process undertaken to construct a thesaurus and explained why a thesaurus is very important in the establishment of a database. Both Directors admitted that the subject, topics and keywords functionality needs to be addressed.   The Director of Technology intends to restructure this part of the database and asked the researcher for input in this process. The Director of Operations has realized the problems associated with the lack of standardisation and consistency. This reinforces the need for a WELLNESS thesaurus which was developed within the design process in Chapter five. Modifications will have to be made by CIRCLE to accommodate the thesaurus.

Figures 6.12-6.14 illustrate the current situation regarding subject and topic allocation, keyword entry and keyword index.
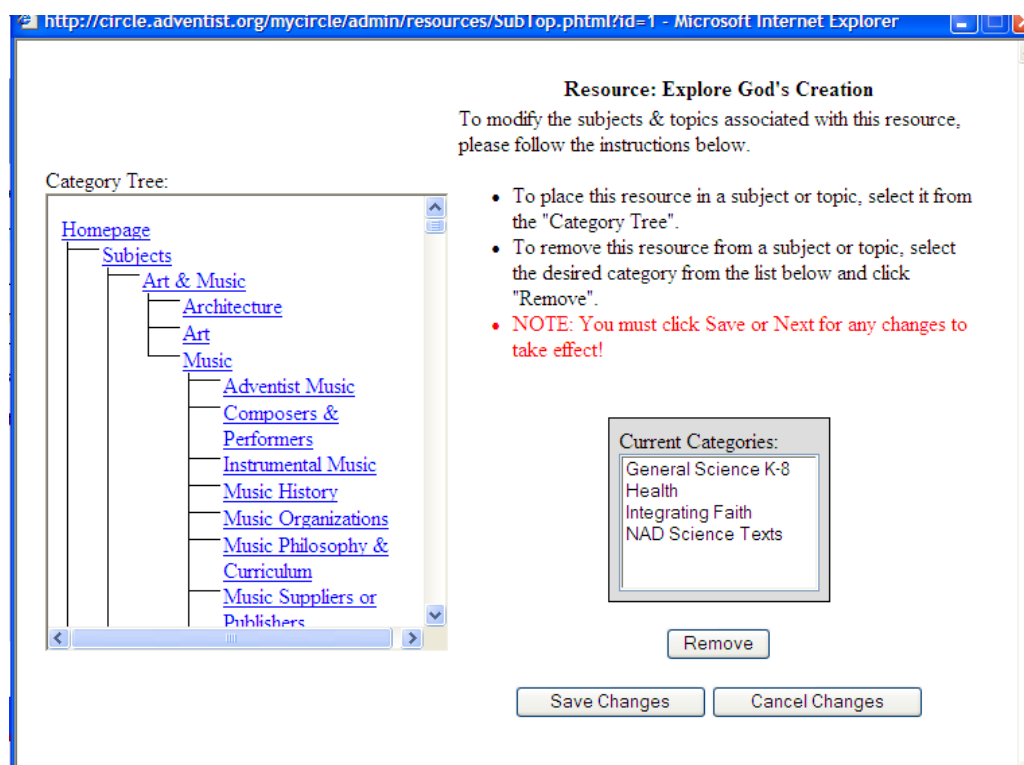
Figure 6.12 CIRCLE Subject & Topic Allocation
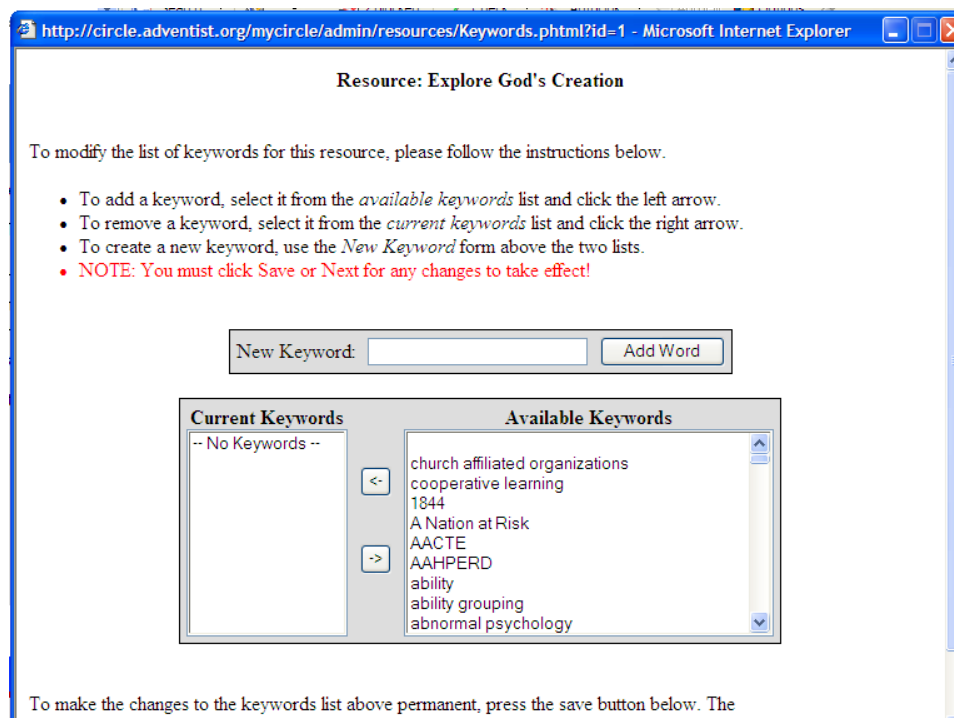
Figure 6.13 CIRCLE Keyword Entry

Figure 6.14 CIRCLE Keywords

The researcher discussed the importance of subject, topic and keyword functionality specifically as input determines output. Easy user access and retrieval is the goal. A thesaurus with a clearly defined list of subjects and

topics together with instructions on how to allocate keywords is required for data entry.

The Director of Technology has agreed to continue work on further design and improvement of the structure of the subjects, topics and keywords, indexing and retrieval mechanisms, and the search results help associated with this. This involves continuous consultation by the researcher with the CIRCLE Directors to improve the CIRCLE resource retrievability while establishing an improved and suitable relational entity structure for subjects, topics and keywords.

The 'Submit to CIRCLE' feature, shown in Figures 6.15–6.19 allows educators to submit resources for inclusion in the database and publication on the web site. This feature will enable WELLNESS health information seekers to submit resources for inclusion in the WELLNESS database. The researcher will review all submissions and determine whether they meet the selection criteria, as established in Chapter four, or not. User submissions will help to increase the resources published on the web site.

Figure 6.15 CIRCLE Submit to CIRCLE Form Screen 1

Figure 6.16 CIRCLE Submit to CIRCLE Form Screen 2

Figure 6.17 CIRCLE Submit to CIRCLE Form Screen 3

Figure 6.18 CIRCLE Submit to CIRCLE Form Screen 4

Figure 6.19 CIRCLE Submitter Information Modification

The CIRCLE database and search engine will allow the WELLNESS health information seeker to search and/or browse WELLNESS resources.

In assessing the conceptual schema in relation to the choice of database host, that is CIRCLE, it became apparent that to map the conceptual schema would involve closer collaboration with the CIRCLE Director of Technology. Figure 6.20 explains this process and reinforces the fact that the development and implementation phases will be the focus of further study as discussed in Chapter eight.
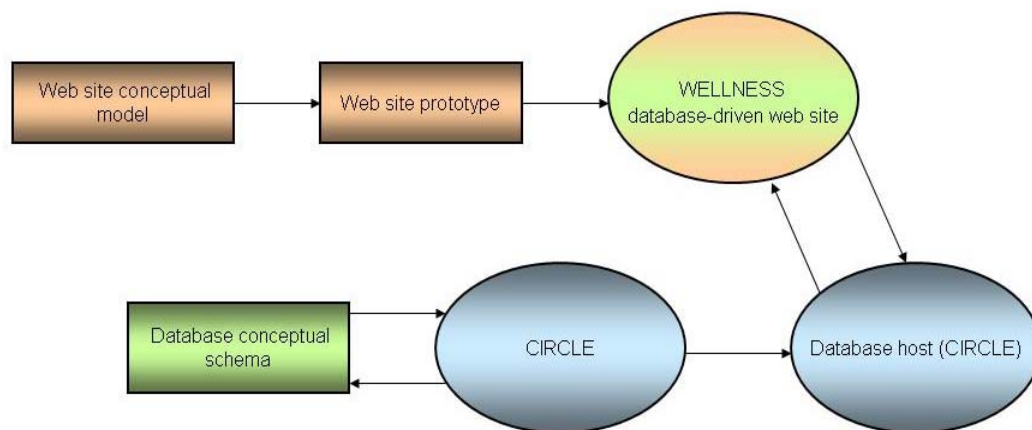
Figure 6.20 Process of conceptual schema mapping

6.5 CONCLUSION

It was determined and discussed in Chapters two and three that health information seekers use the Web to find health information resources. Based on this, the researcher determined that a database-driven web site would successfully and effectively meet the need to provide a reference database of health information resources for informed lifestyle choice. Designing the database included identifying potential database hosts and selecting the host that would facilitate the design of a database-driven web site. The conceptual schema developed by the researcher (Steyn 1999) was assessed in relation to CIRCLE, the selected database host. This included discussions with the management team of CIRCLE on scenarios of how the WELLNESS web site

could be incorporated into the current CIRCLE infrastructure and what modifications would need to be made to accommodate the E-R diagram and the data dictionary.

Chapter seven will investigate the various aspects of the process to develop the prototype WELLNESS web site.

CHAPTER SEVEN

WEB SITE DESIGN

7.1 INTRODUCTION

The focus of this chapter is the design of the WELLNESS web site. The web site will serve as the interface between the WELLNESS health information seeker and the database of WELLNESS health information resources. Web site design is the third and final aspect of the 'tool' to be discussed. Chapter five focused on the first aspect, the thesaurus construction. Chapter six discussed the database design and assessment of the conceptual schema with reference to CIRCLE as database host. This was the second aspect to be discussed and assessed. The WELLNESS health information seeker as 'user' was profiled in Chapter three. The 'resource' as content of the web site and the criteria by which to select these WELLNESS resources was the focus of Chapter four. The 'user', the 'resource' and the 'tool' were researched and discussed to design the database-driven web site of WELLNESS resources to facilitate informed lifestyle choice.

The researcher researched and established the WELLNESS health information seeker profile and the implications for design in Chapter three. An evaluation of existing health web sites relevant to these user needs was then undertaken to establish whether the user needs could be fulfilled by an existing web site or if one needed to be designed to meet the specific, identified need. It was established that a web site to meet the specific, identified need had to be designed.

The conceptual model of the original study (Steyn 1999) comprises the requirements for a web site in terms of functionality, data, environment and context of use, the user and usability, information architecture (IA), principles and elements of design, and the criteria by which to evaluate the quality of the WELLNESS web site. These aspects of design will be practically applied in the development of a low-fidelity paper-based prototype WELLNESS web site.

An heuristic evaluation instrument will be chosen to evaluate the usability of the WELLNESS web site as was recommended in Chapter one, section 1.7.3, and illustrated in Table 1.1.

7.2 DESIGN OF THE WELLNESS WEB SITE

In an optimal design process, every design choice is based explicitly on creating a successful user experience. The user experience is crucial as users will not use the site if a positive experience is not provided. Design should therefore be user-centred (Garrett 2003:19; Preece, Rogers & Sharp 2002:165; Tidwell 2006:3). Quality design means that a web site is accessible to all users and can contribute to empowerment by means of logical, topic-driven and natural groupings of information. Poor design frustrates users, reduces interest and may result in users going elsewhere to meet their information need (Theofanos & Mulligan 2004:47). Different terminology for this includes interaction design and user-centred design. The successful experience means that the user requirements have been successfully met. Clarification of the goals of the user experience and usability are important in the initial stages of design.

Web site design should strive to balance user information and environmental and usability requirements with functional and technical requirements. This is necessary for the user to move through the content sequentially, naturally, efficiently and effectively. Design involves planning, setting goals and executing an intentional strategy. This requires systematic analysis, knowledge of the user needs and requirements, and the principles of design to ensure that the web site will fulfill the user information need quickly and easily. The user perceives the web site as quality because of the way each step makes sense to them (Rosenfeld & Morville 2002:2; Risk 2002:601; Preece, Rogers & Sharp 2002:166).

Aspects of design that were therefore considered in the design of the WELLNESS web site included:

- user needs and requirements

- evaluation of existing health web sites

- conceptual model

- criteria for an appropriate WELLNESS web site.

7.2.1 User needs and requirements

User needs and requirements were discussed in Chapter three with the establishment of the WELLNESS health information seeker profile. The WELLNESS health information seeker needs and requirements are as follows:

- for health information - specifically on the WELLNESS approach - which can be evaluated

- to solve a problem using key words

- for search options

- for browsing options

- to be able to query so that the system will respond to queries even if the user lacks ability to express need in formal statement or query

- for accessibility to and availability of information

- to take personal responsibility for their health

- to optimise health by WELLNESS

- for convenience

- for anonymity

- for diversity of information resources

- for guidance yet freedom

- to make health decisions

- for information for sense-making, to find personal meaning

- to make choices

- to be perceived as rational actors or self-helpers that need information

- for information for assimilation so can mix the known with the unknown

- for current up-to-date information

- for information to support different levels of health

- for resources and tools to support different levels of expertise and experience
- for information that is focused, targeted and organised in an efficient way
- to extend state of knowledge
- for information for change of habits
- to be informed and empowered
- for organised links and structure
- for conventions
- for use of Web
- for subject areas, categories
- for navigation
- to facilitate searching even if user lacks skills
- for a system compatible with user mental models
- for patterns and relationships between concepts reflected in the structure
- for information that is viewed as complete as evidenced in the interaction with the machine
- for a sense of fulfillment and confidence in the system in relation to need
- for an interface that is not a barrier to accomplishing the task
- for information that is professional and credible
- for the use of labels and concepts that enhance searching behaviour.

For the purpose of this study, user needs infers an understanding of the capabilities and characteristics of the user, what and how they intend to achieve their goals, their current methods and whether they would achieve these goals more effectively if they had different support (Preece, Rogers & Sharp 2002:172). Chapter three considered these aspects of the user in the development of the WELLNESS health information seeker profile in Table 3.9 and specifically the implications for design. The web site should be found to be valuable and the technology used should enhance the user experience and not destroy or interrupt it. Usability is crucial to either a good or bad user experience. Continuous and frequent evaluation are key.

Although user characteristics, capabilities and information-seeking behaviour differ, usability includes identifying a typical user in a user profile.

7.2.1.1 *User profiles*

Different user profiles may be used in the design process. Users will include the novice, expert, frequent or casual user. They will vary from the browser (window shopper) to the searcher (deliberate buyer). This means that the instructions and tasks should be clear enough and in sequence for the novice or casual user to be comfortable and able to perform the desired tasks. At the same time it should not frustrate the expert or frequent user by performing unnecessary steps or providing extraneous prompts. The following user profiles represent a WELLNESS health information seeker as browser and as searcher.

a. User profile number 1

This is a profiles a person who is very health conscious and is continually looking for valid, accurate and credible resources to support his/her lifestyle choices and for sharing with others who are perhaps not so knowledgeable, but are interested in learning. A wholistic approach is important to him/her. Continuous searching for new ideas and principles is of interest. It is possible that new information will be integrated into his/her lifestyle. The Web has been used before. There is familiarity with the conventions of various health web sites, but the person has not yet found what they are looking for in terms of a wellness site that supports his/her worldview. This person is an 'expert' and is deliberate about the way in which they use the Web to find resources.

b. User profile number 2

This profiles a person who is interested in being healthy and desires this for their own sake, as well as that of their family. This person does not have much time and is therefore impatient when it comes to using the Web. However, the Web is perceived to be an important source of resources on health.   The person has the potential of accumulating information so as to learn about optimal health. Some changes have been made, but the fact that

he/she does not have expert knowledge may mean that he/she needs to explore what is available in categories of interest. They do not want information on disease, but rather on prevention and health promotion.

In identifying the user needs and requirements for a WELLNESS health information web site, the issue of whether existing health web sites met these needs and requirements was raised.

7.2.2 Evaluation of existing health web sites

Information about and links to existing health web sites were obtained by the researcher by means of an analysis of the literature, Web search engine searches, links from web sites and suggestions from individuals interested in this topic. Types of health web sites visited included government, organisation, institute, academic institution and private entity sponsored web sites.

The MLA (2006) listed the top ten most useful web sites. Upon investigation it was found that the main focus of these web sites was medical information rather than wellness information. This list was therefore not relevant for this discussion. It was difficult to find a web site that was aimed at providing resources for WELLNESS as defined in this study. However the following sites were identified as comparable with the goals, not the content, of the web site being developed.

- http://www.justmove.org
- http://www.shapeup.org
- http://www.eatright.org
- http://www.newstart.com/NSacronym.html
- http://www.ucheepines.org/diet.htm
- http://www.healthylifeinfo.com/index.asp
- http://www.wellness.com

Some of the web sites were professional, had good searching and browsing capabilities, and provided navigation that was conventional. Others provided

resources that were not current and were designed in ways that did not support usability. Most had sponsorship or were promoting a lifestyle programme or products that supported the wellness approach. It was concluded that even those that advocate the 'Adventist health and lifestyle' approach do not concentrate or focus on WELLNESS resources. On the http://www.healthylifeinfo.com/index.asp site, wellness was featured as a topic but, was not included in the global navigation.

This evaluation process reinforced the need for the development of a reference database of health information resources, specifically WELLNESS resources, to facilitate informed lifestyle choice. No web site was found that would meet the user needs and requirements established and provide access to resources reflecting the WELLNESS approach. This process also provided the researcher with an informed perspective of design by establishing the conventions, the content, the IA, elements of design, navigation and principles of design used in this type of web site. This will inform the design of the WELLNESS web site.

After establishing the need for the WELLNESS web site, it is important to conceptualise the WELLNESS web site design.

7.2.3 Conceptual model

A conceptual model is a description of the proposed system, how it will behave, what it will look like and what it should do for the purpose of the system being understood by the users. Conceptual design involves submerging oneself in the user information needs and trying to simulate the user and tasks that the web site will need to support.

The interface metaphor, interaction paradigm and the interaction mode are different ways in which the user will interact with the system (Preece, Rogers & Sharp 2003:40-55). Conceptual models are based on the following types of interaction modes, namely, instructing, conversing, manipulating and navigating, and exploring and browsing. Instructing infers that when the user is performing tasks they are actually instructing the system. These

instructions include typing in commands, selecting options from the menus and using a combination of functions keys. In conversing the user types in questions and 'speaks' to the system. When users are working their way through the information space they are generally manipulating and navigating their way through. Exploring and browsing assumes that the system provides information that is structured for users to discover or learn about things without having to speak directly or address specific questions to the system (Preece, Rogers & Sharp 2002:41). Conceptual models can simulate the browsing or searching function, as well as a hybrid model in which both the searching and browsing functions are conceptualised.

The interaction mode of the WELLNESS web site was based on the actions that the user will undertake when interacting with the web site. The activities were identified in the requirements section. Users will first explore and browse in order to identify a WELLNESS category. This allows users to explore and browse WELLNESS information via hyperlinks to obtain information for decision-making. Instructing will occur when the user selects from a range of functions that will be provided. The user instructs the network what to search for and what activities to perform. This will allow quick and efficient interaction in selecting options and making decisions. Many of the actions performed will be repetitive and in sequence as the web site responds appropriately as instructed. Conversing will occur when the user enters search terms, selects options for browsing and the web site responds by providing results or prompts to which the user responds.

The conceptual model for the WELLNESS web site was based on the interaction metaphor of a library catalog system and networks and wireless devices such as the cell phone or portable digital assistant (PDA). The interaction paradigm upon which it is based is ubiquitous. The web site can be accessed 24/7 from a public or private space, given that there is Internet access.

The conceptual model of the WELLNESS web site considered the following design factors:

- requirements

- usability

- IA

- navigation features

- principles of design

- elements of design.

7.2.3.1 *Performance* r*equirements*

Requirement is a statement about an intended product that specifies what it should do or how it should perform (Preece, Rogers & Sharp 2002:204). One of the aims is to make the requirements into an outcome that is stated specifically and as unambiguously as possible. The requirements are based on the data gathered in the identification of user needs and requirements' phase. The five aspects of establishing requirements are: functional, data, environmental, user and usability.

a. Functional

The WELLNESS web site should provide relevant, appropriate, credible and current WELLNESS health information that reflects an holistic approach. There should be quality assurance. There should be general information on wellness, the eight main components/sub-categories of WELLNESS, subjects, authors, titles, abstracts, annotations on resources, as well as on links to other sites. Answers to questions should be provided and user tasks should be fulfilled.

The system should be menu-driven, provide help and guide the user through processes, provide a choice of access points for input and facilitate output. The user needs to have both browse and search options. Browsing helps one see what is available. At other times the user wants to use search terms to find appropriate resources, whether it be subject or topic or author. Users should be able to:

- browse a list of topics within various categories and identify the resources they would like to consult
- enter a subject or topic and browse a list of resources and identify those of interest to them
- enter an author's name and receive a list of resources written by him/her
- find information by resource type
- find information on an individual or organisation.

Subjects and topics, authors, resource types, individuals and organisations should be access points.

The WELLNESS web site should be organised to meet quality principles. It should be housed on a stable Internet location with good connectivity so that the different users can easily find the resources they require in a centralised location. The web site should be downloaded in a reasonable time period. Maintenance of the web site is a key issue.

b. Data

It is projected that the WELLNESS database will handle great amounts of data. It should be exhaustive, but also limited by the categories that constitute the approach of WELLNESS. The data should change to reflect the user activity. It should be accurate, up-to-date, valid and a reflection of the goals of the web site. It should include the information as identified in the functional category. Resources should be available and accessible. Any duplication should be avoided.

c. Environmental and context of use

The physical environment will probably be the use of a personal computer in a personal setting, at any time of the day or night. The Internet is a medium that will support this requirement. A database-driven web site will facilitate availability, accessibility and organisation of the information. It is expected that the web site will suit the different experience and expert levels of the

user. Technically, the web site will be viewable on all web browsers including Internet Explorer, Netscape, Fire Fox and on both personal computer (PC) and Apple Macintosh. A variety of outputs should be supported, namely print out, save to universal serial bus (USB) or CD-ROM.

d. User

The content should support the decision-making of the WELLNESS health information seeker in order to foster personal responsibility, empowerment and support lifestyle change. The user should be provided with an opportunity to submit recommended resources. The information provider should use the selection criteria to decide whether the resource should be included or not.

e. Usability

The web site should be up-to-date, maintained and contain accurate information; in other words it should be synchronous. The web site should be viewable or compatible with multiple systems and browsers. It should be obvious to the user where they are in the web site. Clearly visible clickable options should be provided. This will result in a site that is easy to use. A help or FAQ page will be provided for user support.

After the functional, data, environmental and context of use, user and usability requirements were stated, the usability of the user interface was researched.

7.2.3.2 *Usability*

In profiling the WELLNESS health information seeker in section 3.5, Table 3.9, the implications for design were identified. The components of usability were considered important for the WELLNESS web site design.

Usability is a quality attribute that assesses how easy user interfaces are for the user to use. What can be found that is valuable in the least amount of time is critical to the user. Usability means making sure that something works well and that people of average ability and experience can use the 'thing'

intended to be used with the least amount of frustration and effort. This requires spending time with the user during the design process (Krug 2000:5,6,19).

User experience refers to what the system feels like to the user. Its goal is for the user to have a satisfying and pleasurable experience. The possibility of the WELLNESS web site providing access to WELLNESS resources that have the potential to persuade the user to make lifestyle choices and lifestyle change should be done in such a way that the user will be intrinsically motivated and even excited about the prospects of improved health. This goal should be perceived as attainable and be made with ease. Frustration should be minimal. The interface should support the searching and browsing activities to avoid a user feeling of incompleteness and/or inadequate retrieval. Queries resolved and problems solved stimulate further inquiry, sense-making, development of knowledge and the desire to make choices and changes. The visual presentation should be aesthetically pleasing and facilitate pleasure in interaction with the system. The experience should result in a desire to return to the site in the near future, as well as to inform other potential users of its value.

Components of usability include:

- learnability - how easily users can accomplish basic tasks first time around
- efficiency - the speed with which users can perform tasks after having learned the design
- memorability - how easily users reestablish proficiency after not using the design for any length of time
- errors - how many errors are made by the users, how severe they are and how easily the user can recover from them
- satisfaction - the pleasantness of the design
- effectiveness - how well the system does what is intended
- safety - protection of the user from any situation which may cause harm, including the fears of making errors and hostility towards the system

- utility - functionality of the system for the user to be able to do what they want to do
- noise - clutter and busyness should be minimised and what is clickable should be made obvious (HHS n.d.; Krug 2000:1; Nielsen 2003; Preece, Rogers & Sharp 2002:14-18).

Learnability and memorability are important goals in the design of a self-care web site. The web site needs to be simple for novices, first time users and those with low levels of health information literacy to be comfortable and able to accomplish their tasks. It should be easy to remember the process of searching and/or browsing. Conventions should be followed.

Utility means that the web site should be functional. This enables the user to do what they intend to do, namely to find resources and to make decisions and choices. The process of searching and browsing for resources should determine the organisation of the web site. Functionality should reflect the steps that the user will use in order to obtain resources that are appropriate.

Visibility infers that feedback is provided about the current status of the system. The name of the page where the user is currently located should be obvious. It should be clear to the user how to browse the different categories of wellness.

The system should be efficient in the processing of functions and errors should be minimised to ensure efficiency and effectiveness of the Web. The system should respond to the user by confirming his/her actions.

Safety suggests that the privacy and confidentiality of the user should be protected. The interactive system should be perceived by the user as safe. This will result in the user having confidence to explore and try out new or unfamiliar operations.

Users can instruct the system to browse a category by choosing a category, clicking on it and then following the hierarchical sequence of presentation to

sub-categories and finally to a list of resources. Users can search by entering a search term and then clicking on the search function to find a specific resource by means of author, title or subject and keywords. This allows quick and efficient interaction by performing an intentional action in order to achieve a result. Most of the actions performed will be repetitive. Conversing occurs when the user responds to prompts from the system or selects an option to which the web site responds by giving different answers.

Habit and mindless choices are important in ease of use, that is usability (Krug 2000:31). Conventions are learned and provide a 'reflex' to different situations because of familiarity and consistency of experience. Conventions are useful as consistency, uniformity and familiarity with the design of other web sites facilitates ease of use and task accomplishment. It is important to make the interface consistent with that of other comparable web sites and to make the interface consistent with itself. Using a master lay-out or template supports internal consistency and contributes to familiarity. Using part of the system will help negotiate other parts thus getting the user to his/her goal faster and with fewer mistakes (Garrett 2003:118,147).

Scenarios based on the user profiles number 1 and 2 (section 7.2.1.1) to determine whether the usability factors identified above would be realised in the WELLNESS web site were described.

a. Scenarios

Collecting information about users can be valuable, but making users more real by turning them into personas can clarify the process. A persona is a fictional character constructed to represent the needs of a whole range of real users (Garrett 2003:54). The scenarios are a narrative description of how identified users will interact with the web site and describe the steps involved. Scenarios based on the user profiles (section 7.2.1.1) were used to clarify the searching and browsing functions of the web site. Scenario number 1 was based on user profile number 1 and the search function. Scenario number 2 was based on user profile number 2 and the browse function.

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- Scenario number 1

Jack Jones runs workshops and seminars in his community. He learned about health and wellness from his general practitioner and has always kept current with trends in health care. He requires an wholistic and lifestyle oriented approach. He plans to concentrate on the use of water as part of the approach to WELLNESS. He wants to be well-prepared and professional. He searches the WELLNESS web site to find current resources that substantiate the importance of hydration and the basic principles for the use of water in WELLNESS. He creates a hand-out of the resources that he finds. He also includes the use of water to prevent the common cold as his workshop will be at the beginning of winter and he knows that this will meet information needs.

- Scenario number 2

Joan Collins is a housewife and mother of three young children. She has a part-time job. Since her children have allergies and get colds often, she is looking for prevention resources to not only stimulate their immune function, but also to relieve some of the difficulties they have. She feels that she can take care of some of these problems herself in a natural way. This includes knowing what foods will be good and how sunlight and fresh air can help with nasal and coughing problems. Her neighbour has suggested that the use of water can also work well. She has not had much experience in using a computer and is therefore a novice in using the Web for finding health information. She uses Google and finds the WELLNESS web site. She finds that water is one of the topics listed on the homepage. Other components of health such as nutrition are also listed. These are the topics that she is interested in and considers to be natural health topics. She browses and finds that one of the categories is 'water'. She clicks on it. She then sees that one of the sub-categories is hydrotherapy. She clicks on this and gets the hydrotherapy page that provides her with a list of resources.

The scenarios clarified the interaction of the WELLNESS health information seeker with the web site and the steps taken. Based on these scenarios, a

task analysis was performed to describe the steps that the user takes to perform a task.

b. Task analysis

The task analysis describes the step-by-step actions that a user will perform in accomplishing a task. The path that the user takes through the tasks and subtasks will vary based on the task they wish to perform and how they want to interact with the web site. For example, the subtasks required for finding a resource will differ according to the function the user chooses, that is browsing or searching. There are a number of tasks that the WELLNESS web site can accommodate. It was not possible to develop a task analysis for all of these possibilities. One of the tasks was identified and used to describe the actions of the user. The task analysis is based on the scenarios. Scenario number 1 reflects searching and scenario number 2 browsing.

- Task analysis for Scenario number 1

In order to find resources on hydration
0. Go to the web site
1. Enter search term
      1.1   find search box
      1.2   type "hydration" in the search box
      1.3   choose the type of search from the drop-down box
      1.4   click on search
2. Search results page displays
      2.1   go through the list to find a relevant resource
3. When one is found click on that resource to check its appropriateness
4. Resource found to be appropriate
If inappropriate, then browse, use advanced search, different search term or use water in list of categories and subcategories

- Task analysis for Scenario number 2

0. Go to the web site browse

1. Select a broad category

      1.1   sub categories and results display

      1.2   evaluate results

      1.3   select resources

2. Search results page displays

      2.1   evaluate results display, go through the list to find a relevant resource

3. When one is found click on that resource to check its appropriateness

4. Resource found to be appropriate

Plan 1 if resource is not appropriate
Plan 2 if no resources are found

A draft task analysis was initially drawn up. It required much thought and reflection to identify all possible tasks and subtasks, as well as the order in which the user would perform these tasks. It was complicated to include all possibilities. Ultimately, the draft task analysis was used as the basis, but as additional tasks were identified, they were added until the task analysis was believed to be complete.

This usability discussion influenced the other factors considered in the conceptual model of the WELLNESS web site. The prototype developed in section 7.3 reflected the quality attributes of usability.

7.2.4.3 *Information architecture*

IA is the structure of the web site. It focuses on design, organisation, indexing, labeling, the structure of information or content and navigation systems that will support searching and browsing and facilitate intuitive access to content and the completion of the task, namely information retrieval (Alexander & Tate 1999; Danaher, McKay & Seeley 2005:e12; Garrett 2003:27,94; Rosenfeld & Morville 2002:2).

Information has its own conceptual structure. The node is the basic unit of information structure and should be organised by either being kept separate or grouped together according to user needs and site objectives. Nodes can be arranged in various ways such as in tree, hub and spoke, hierarchy and child and parent nodes. The challenge of design is to create the structure that best matches the mind (mental model) of the user. It should provide a successful and pleasurable user experience and anticipate user expectations (Garrett 2003:97,103).

Danaher, McKay and Seeley (2005:e12) state that the rationale for using any particular IA design is theoretical and that the design has to do with intended usage. They further state that the Web is potentially a persuasive technology and IA designs can impact online behaviour change. For the purpose of this study, the goal of IA is to inform and positively influence the behaviour of the WELLNESS health information seeker in terms of lifestyle choice and lifestyle change. Table 7.1 provides an overview of the possible IA designs relevant to health information-seeking with a brief summary of their structure, the advantages of the structure for the user, the problems associated with the design and how the user responds to these, as well as the typical uses of each design as adapted from Danaher, McKay & Seeley (2006:e12), Farkas & Farkas (2002:148,316) and Garrett (2003:20).

Table 7.1 IA designs, uses and user responses

IA Designs	Structure	Advantages for the user	Problems	Disadvantages for the user	Typical uses
Free-form matrix	• Very orderly • Little info structure • Uses multiple links to content on different pages	• Provides navigational freedom • User can review all web site content • User embodies hypertext, HTML, and the web • Use own path • Speeds up search	• Too many links • Search pattern not anticipated	• User has to search all listings • User disorientation • Difficulty in retracing steps to review	• Government-sponsored broad health topic web sites • Used mainly for reference purposes • Used for making comparisons • Suitable for small web sites • For experienced users seeking education/enrichment
Hierarchical, top-down	• Creating groups • Orderly arrangement of nodes and links • Broad themes with increasingly detailed content • Links on homepage correspond to broadest groups • Fewer links between pages	• Maximum amount of content offered on a web page • Similar to table of contents, directories • Makes navigation easier • Gives a sense of structure to user's experience • Small chunks can be explored quickly in a non-sequential way • Reduced user confusion • Retracing steps is easier	• Content nested too deeply	• User confused if mental model of content grouping does not correspond with structure	• Used most often in web sites • User makes succession of choices (one group after another) to find content • Approximates the mental model of user and the subject matter • Ideal combination of freedom and orderliness
Tunnel	• Design guides user experience • Complexity is reduced • Ordering of content • Pop-up windows display extra information	• Step-by-step approach (lock-step) • Less anxiety • User kept in tunnel	• Rules of hypertext are broken • Standard browsing tools are removed, i.e. navigation bars, tab rows etc. • Tunnel confines user	• User has less freedom • User doesn't browse • Is forced to go through sequences • Requires patience of the user • Has to become comfortable with unfamiliar interface	• Online surveys and purchase web sites • -e-learning courses • Multi-session programmes when user does assigned tasks • Suitable for reducing ambiguity about attempts to change behaviour • Suitable for user committed to step-by-step change • Useful for instruction • Can be targeted by content to needs of a particular demographic audience
Hybrid: Matrix and tunnel Mixing and matching matrix Tunnel and hierarchy					• Gives more guidance but more freedom than lock step • Involved in own learning – interacting with content • Provides richer and more effective learning experience and outcome • Reduces user attrition

The hierarchical, top-down IA was chosen for this study as it is a common structure used in web sites. Users are familiar with the structure and will therefore immediately identify the structure of the content. This type of structure is appropriate for the WELLNESS web site in that the broad theme of WELLNESS leads to more detailed content, that of the eight dimensions of WELLNESS. The links on the homepage correspond to the broadest group of WELLNESS resources.

The WELLNESS homepage is the entry point to the web site. It provides an introduction to the site and can be returned to at any stage in the search or browse process. Categories of WELLNESS are listed as links allowing the user to browse. The organisation of the IA narrows the scope of the search and thereby saves time and frustration for the user. The user can click on a category and the system will return sub-categories and resources. A search section allows the user to enter text and search a subject of their own choosing providing options that will define the search such as 'any words', 'all words', 'phrase', 'author'. The system will return resource information. If the search term has not been entered correctly, the system will provide a message stating that it does not recognise the search term. It will suggest alternative terms.

In the WELLNESS web site IA, each screen specifies its purpose in its title and in the information provided. The web site follows the conventions of a wellness health site. Clickable links are clearly distinguishable and identified by icons, buttons or underlining. To support memorability and learnability, there should be smooth flow between screens. The hierarchical IA contributes to the memorability usability goal. Options and information were made visible and clear. Only necessary information was displayed on screens to minimise clutter. In order to facilitate interaction, tips were given to motivate health choices. The layout and design of the web pages should be consistent throughout the web site. It should be clear what functions are possible and the consequences of each action. Feedback is given in response to each action to inform users of where they are in the process and what has occurred. Any information previously selected or input by the user

was displayed on subsequent screens. To minimise error, the user is required to return to previous screens to change any options or input. At any point the user can exit the search.

A wireframe is a visual representation of the IA. A simple line drawing that is heavily annotated depicts the page layout and represents where information, interface and navigation design meet. The wireframe serves as a template that builds on the conceptual structure and represents the transition towards the visual, physical design (Garrett 2003:135-137). The pages of the web site were based on the wireframe. A wireframe, Figures 7.1-7.3, was developed for scenario number 1 to visually represent the IA of the WELLNESS web site. The first level represented the homepage, the second level the results page and the third level resource detail.
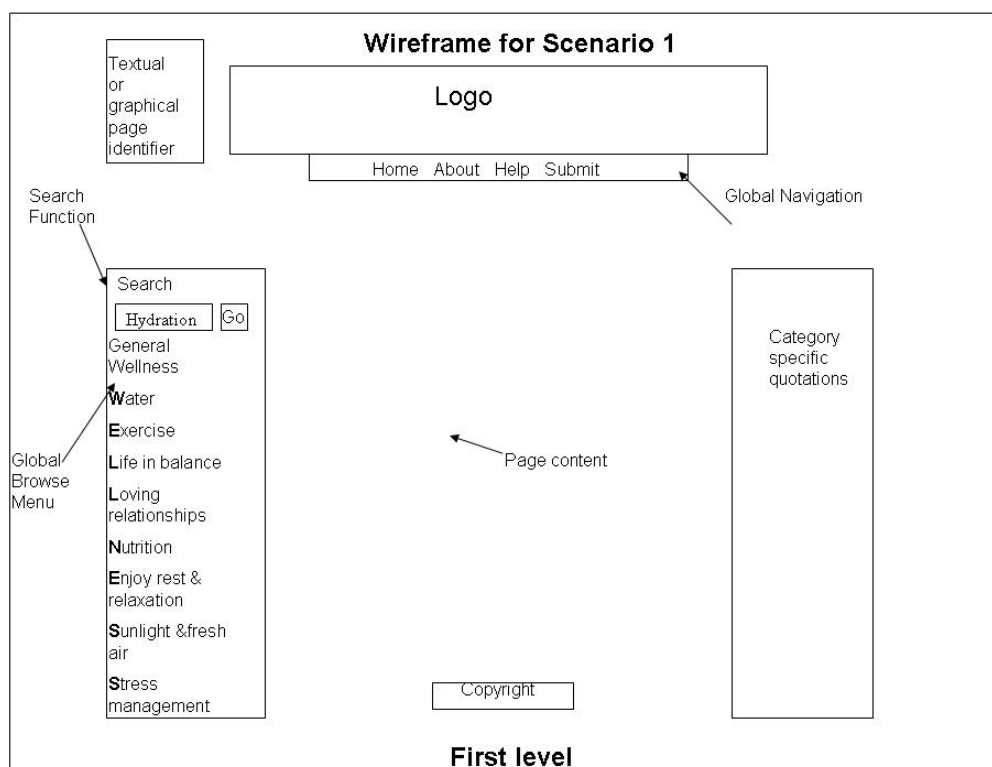
Figure 7.1 Wireframe for Scenario 1 – First level

Wireframe for Scenario 1

Textual or graphical page identifier

Logo

Home About Help Submit

Global Navigation

Search Function

Search results

Search

Go

General Wellness

Water

Exercise

Life in balance

Loving relationships

Nutrition

Enjoy rest & relaxation

Sunlight &fresh air

Stress management

Global Browse Menu

Hydration Resources: (showing 1-20 of 100)

1. Resource
2. Resource

Category specific quotations

Copyright

Second Level: Results

Figure 7.2 Wireframe for Scenario 1 – Second level: Results

Wireframe for Scenario 1

Textual or graphical page identifier

Logo

Home About Help Submit

Global Navigation

Search Function

Search

Go

General Wellness

Water

Exercise

Life in balance

Loving relationships

Nutrition

Enjoy rest & relaxation

Sunlight &fresh air

Stress management

Global Browse Menu

Resource detail

Category specific quotations

Copyright

Third Level: Resource Detail

Figure 7.3 Wireframe for Scenario 1 – Third Level: Resource Detail

7.2.4.4 *Navigation features*

The content of a web site is critical in terms of the user information need. Navigation serves to communicate between the elements, help the user find what he/she is looking for, tell the user where he/she is, support the searching and browsing behaviour, impact user performance, tell what choices there are and facilitate confidence in the designer knowing that goals are being met (Garrett 2003:126; Krug 2000:59,60). Van Schaik and Ling, as quoted by Bond (2004:254), suggested that having the navigation frame on the left or at the top of the page enhanced speed and accuracy of performance. Quality navigation facilitates user wayfinding and assists him/her in meeting his/her objectives, that is access to WELLNESS health information. It also helps the designer to achieve their goal of facilitating access to WELLNESS health information resources and informed lifestyle choice.

Garrett (2003:127-130), in Table 7.2, identified the following types of navigation: global, local, supplementary, contextual and courtesy.

Table 7.2 Types of navigation

Types of navigation	Description
Global	• Provides access to broad sweep of entire site • Brings together key set of access points from one end of site to the other
Local	• Access is provided by what is nearby in the architecture
Supplementary	• Shortcuts to related content are provided
Contextual	• Embedded in the content of the page
Courtesy	• Includes contact information, feedback forms, policy statements providing convenient access to user
Remote navigation tools	• Not embedded in the structure of the pages • Potential for the user to use

Navigation features include the homepage as the starting point for navigation, wayfinding, hyperlinking and language and terms. These features were all considered in the WELLNESS web site design.

a. Homepage

The homepage should answer the following four questions; what is this? what can I do here? what do they have here? why should I be here and not somewhere else? The homepage identifies and accommodates the mission of the web site; the hierarchy; searching and browsing; promotions and deals; timely content; registration; the intended audience; the purpose of the site; authorship; short cuts; hyperlinking; and it teases the user. The WELLNESS homepage, included as Figure 7.5, identified the web site mission as WELLNESS by the use of the acronym WELLNESS. The hierarchy was indicated by the WELLNESS categories on the left-hand side of the page. Searching and browsing options were provided by the use of a search box for searching and WELLNESS categories as links to navigate to more content. Users searching for WELLNESS information would be able to tell from the homepage what the web site content was.

The tagline as welcome blurb, should be clear, personable, clever and informative (Garnes & Mills 2001:184; Krug 2000:101). "Your choice…WELLNESS….Be wise" was included as the tagline. The use of tabs on the homepage suggests a physical space and helps to structure the web site and provide continuity across all pages. 'Home', 'About', 'Help' and 'Submit' tabs were included on the homepage and help to provide continuity across all pages. Huntington *et al* (2004:245) recommend that health sites should have a disclaimer stating that the information is for general use and that a PCP should be consulted on specific health problems. A disclaimer was included on the WELLNESS web site.

b. Wayfinding

This is the way in which the navigation and information design interact to support user activity in terms of access and communication choices made. The user has a mental picture of where they can go and what choices will support their objectives. Wayfinding support includes page elements, icons, labeling systems, typography, etcetera (Garrett 2003:134). Wayfinding

support in the WELLNESS web site was given by the use of different elements and principles of design discussed in section 7.2.3.5 and 7.2.3.6

c. Hyperlinking

Hyperlinks have important uses, namely:

- to link from one web page or web site to another
- to provide credibility for the site
- to check quality by linking to sources concerned with quality such as MLA and HON
- deeper navigation within the web site hierarchy
- to link to other sites with similar goals and content
- to link to search engines, for example Google, which ranks sites partly by the number of inbound links
- for interactivity which includes feedback and the means for exchange of information (Health Summit Working Group 1999; Hernandez-Borges *et al* 1999; Krug 200:104).

Doshi *et al* (2003:110) remarked that designers who have the goal of providing information for users to aid in lifestyle choice or change may be able to advance their promotion of wellness by directing users to specific web sites that provide application of accepted behaviour change theories. These provide assessment, individualised personal assistance and feedback. Examples of these types of sites are http://www.justmove.org, http://www.shapeup.org and http://www.eatright.org. Providing links to such sites helps to establish the credibility of a web site, informs the user of additional information resources and contributes to the creation of the WELLNESS resource. The researcher will include links to these types of sites and use the content selection criteria established in Chapter four to make these selections.

d. Language and terms

Users should be familiar and comfortable with the language and terms used on the web site. Knowledge of user heath and computer literacy are

important. Navigation is dependent on the level of understanding of the descriptions, terms and labels. These terms should be as close to natural language as possible. This is particularly true of a health information web site because of the potential difficulties with terminology that is scientific, medical and jargon (Garrett 2003:101; Krug 2000:45). A WELLNESS thesaurus was developed in Chapter five to provide an authority list and indexing terms to support ease of use and a successful user experience for the WELLNESS health information seeker. The use of consistent and standardised terminology will facilitate usability and search and retrieval.

The IA and navigation facilitate usability. The visual arrangement of the information is also an important design factor.

7.2.4.5 *Principles of design*

Design includes the visual arrangement of the pieces of information. The web site consists of content. One of the goals should be to communicate the information as effectively and appealing as possible for it to be absorbed and understood in order to make informed choices and decisions as well as personal judgments (eHealth Ethics Initiative 2000). The WELLNESS web site should be usable and functional. It should provide information in which the key elements of visual presentation are integrated in order to appeal to the user.

A professional look and official touch supports the user's perception of the credibility of the web site (Beaird 2007:4; Eysenbach & Kohler 2002:574; Fuller & Hinegardner 2001:339; Garrett 2003:145,146). A simple approach to visual design of a page and of the web site is to ask basic questions such as: Where does the eye go first? What elements draw the user's attention? Is the object of their attention important to the strategic objectives or is it a distraction?

There should be a clear hierarchy on each page. There are three traits of clear visual hierarchy. Firstly, the more important something is, the more

prominent it should be; secondly, things that are related logically are also related visually; and thirdly, things are nested visually to show relationships. Visual design processes the page for the user (Krug 2000:32,33). Contrast draws attention to essential aspects of the interface. The visual hierarchy should facilitate scanning and show relationships between elements.

Principles of design include economy of space, unity and variety, emphasis and balance and white space.

a. Economy of space

Limiting the number of elements that are on a page ensures that the user is not overwhelmed. Consistency in placement of elements allows the user to detect patterns and ensures usability. The logo and the categories of WELLNESS are repeated on every page in exactly the same place on the WELLNESS web site.

b. Unity and variety

Unity refers to the way in which the different elements interact with each other on the web site (Beaird 2007:17,18). Variety helps to keep the user interested. Repetition of the eight components of WELLNESS in the logo as icons, as well as textual list in the left-hand global browse menu creates a sense of unity. The consistent use of colours, typography and backgrounds ensures unity while keeping the attention of the WELLNESS health information seeker.

c. Emphasis

Emphasis is closely related to the idea of unity. It draws attention to a particular element (Beaird 2007:18). The icons representing the eight dimensions of WELLNESS in the logo draw attention to the intent of the site. When a category is searched, the textual or graphic page identifier in the top left-hand corner is highlighted. Placement considers the point at which the

users will first look. Users naturally read from left to right. The global browse menu was placed on the left-hand side of the page.

d. Balance and white space

Visual balance ensures that the elements of a layout balance one another out. Two main forms of visual balance are symmetrical and asymmetrical balance. Symmetrical balance occurs when the elements of a composition are the same on either side of an axis line. This type of symmetry, called horizontal symmetry, can be applied to web sit layouts by centering content or balancing it between columns (Beaird 2007:12,13).   Symmetry was used in the WELLNESS web site to ensure balance. As can be seen in Figure 7.5, a single column was used at the very top of the page containing the logo, moving down to three columns containing the global browse menu, the page content and the category specific quotations, while still maintaining its symmetrical balance.

White space refers to any area of a page that is not covered by type or illustrations.   Having empty space on a page is as important as having content. Carefully planned white space will ensure that the design does not feel closed in. White space helps to guide the user's eye around the page, but also helps to create balance and unity (Beaird 2007:8).

7.2.4.6 *Elements of design*

Design elements relevant to the design of the WELLNESS web site were colours and backgrounds, typography, readability and user control.

a. Colours and backgrounds

Certain colours and backgrounds were used consistently throughout the web site. A monochromatic colour scheme of shades of the base colour blue was used to connote the concept of wellness to reinforce the idea of health, natural, openness, faith, intelligence.   Blue is universally appealing and attractive because of its visual association with water, the sea and the sky (Beaird 2007:41,42). The logo stands out because the visual representations

of the dimensions of WELLNESS are intended to be realistic. Black was used for headings as it adds life to light backgrounds and is easy to read. A colour was used for the background rather than an image or watermark to ensure readability.

b. Typography

Font types should support the information and be compatible with user software programs. The choice of font should be made from a list of nine font families known as 'the safe list' (Beaird 2007:100). A standard sans-serif font, 'Verdana', was used for the WELLNESS web site. A font size that was legible, consistent and familiar to the user was used. Initial capital letter and bold text was used to accentuate the acronym WELLNESS to draw attention to each of the words and their navigability. Capital letters were centred and used to draw the user's attention to the specific location or page, for example WATER, next page EXERCISE, etcetera.

c. Readability

Readability includes succinctness, scannability and using hypertext to split long information into multiple pages. According to Nielsen (2000:101) users expressed unpleasantness when reading online text. In the context of levels of health information literacy it is essential to consider the user's experience in reading online. Text should be kept short, scrolling should be limited and errors minimised. The construction of a WELLNESS thesaurus facilitates readability by the use of consistent and standardised terminology.

Skimming and scanning are preferred reading skills on the Web. The user should be able to identify the purpose and content of the web site within a few seconds so as to engage their interest as they scan and skim. This is consistent with searching and browsing user behaviour. Bulleted lists and highlighting support attention to the text.

d. User control

The choice of an hierarchical, top-down IA enables the user to make a succession of choices to find content. It provides a combination of freedom and orderliness.   This IA also gives a sense of structure to the user's experience and reduces their confusion.   The ability to hyperlink between pages allows the user to exercise control and determine where they want to go and what will be the most useful information for their purpose.   The availability of the WELLNESS web site on the Web allows the user freedom to view the web site when they choose. These factors support user control and are some of the reasons expressed by WELLNESS health information seekers for why they use the Web for health information.

7.2.4 Criteria for an appropriate WELLNESS web site

There are two aspects to consider when evaluating the appropriateness of a web site, namely the quality of content on the web site and the quality of the web site itself.   In section 4.4 the criteria to assess the quality of web site content was discussed in the context of resource selection criteria. The work of the following authors (Adams & Berg 2004:15; AMA 2003; Burkell 2004:496; Calabretta 2000:4; Childs 2004a:15; Crespo 2004:366; Delamothe 2000:843-844; Duffy *et al* 2003:281; Dutta-Bergman 2004b:254,257,259; eEurope 2002:e15,21; eHealth Ethics Initiative 2000; Eysenbach *et al* 2002; Eysenbach & Kohler 2002:574; FDA 1996; Fogg 2002; Fox & Rainie 2002:33-34; Fox & Rainie 2003:17; Gagliardi & Jadad 2002; Garnes & Mills 2001:183; Mitretek Systems 2003; Tombros, Ruthven & Jose 2004:327; Godin,Truschell & Singh 2005:72; Greenberg, D'Andrea & Lorence 2004:e18; Gummerus *et al* 2004:175; Health on the Net (HON) Foundation 2003a; Health Summit Working Group (HSWG) 1999; Kunst & Khan 2002:44; MLA; NCI 2003; NLM 2003a&b, 2006; Purcell, Wilson & Delamothe 2002:557; Risk & Dzenowagis 2001; Wilson 2002) was studied in order to compile the list of web site quality factors that should be considered in the WELLNESS web site design. Figure 7.4 illustrates these.

Figure 7.4 Web site quality factors

7.2.4.1 *Authorship*

The authority of the source should be clear. Lists of authors and credentials should be provided. References and citations are important for credibility. The credentials of the author (or any organisation involved) of the web site should be clearly stated. Expert consensus is used and the professional, personal experience of all contributors is verified. Quality is also judged by partnerships.

A web site is legitimised with physical address, name hosting and if needed, details of a sponsoring organisation. Availability for contact is important. Reliability relates to identifying the organisation or people who maintain the site, editorial board, their credentials, names of reviewers, links to other sources, currency of the site, timeliness of the material, the use of multimedia, fees charged and services rendered. The policy of disclosure should be clearly stated. This includes the fact that the webmaster will not assume the role of consultant or cyber doctor as the intention is to provide access to resources. Trust depends on the characteristics of the service provider such as perceived competence, integrity and benevolence. It is built on a relationship and leads to a sense of satisfaction in terms of fulfillment of need.

Trustworthiness is established by indicating authorship, referencing of information, stating claims and benefits, by links and a disclaimer regarding the authority of the PCP.

7.2.4.2 *Sponsorship*

Sponsorship identifies any organisation, partnership, promoters, advertisers, government agencies. This supports the WELLNESS health information seeker in discerning quality of the web site and its content. Viewing the WELLNESS health information seeker as a consumer has possible negative results. Web sites that are sponsored by advertisers and promote health products often fall prey to the gatekeeper. This will impact on the resources selected and the user's freedom of choice. Promotions and products are the focus of e-commerce and e-health. The researcher decided that at this time no advertising would be considered.

7.2.4.3 *Currency*

Health information changes frequently. Information should be up-to-date as users expect this. Publication and review dates, when substantive changes were last made and when information and the web site are updated, should be published. The user should also be aware of when updates will take place.

7.2.4.4 *Credibility*

Credibility includes source, currency, relevance and site evaluation. Credibility is the power to inspire belief. The user experience in terms of what is believable is important. This implies that the design and interface support the user experience. The user should be satisfied that the information matches the stated and implied objectives. Besides the immediate purpose, the user will probably expect improved health because of changed lifestyle behaviour. Credibility assumes that the source is acceptable, reliable and professional, the author has experience and expertise, and that on the whole the web site is trustworthy. Information retrieval should be supported by

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knowledge of the information- seeking process. Information-seeking is a prominent use of web sites and topic-appropriateness and user-utility are basic to the perception of the user that this activity will result in relevant information. The WELLNESS database-driven web site information provider should be honest about controversial issues.

7.2.4.5   *Completeness*

Completeness is defined as having all the necessary parts, elements and steps. Interaction between message completeness and web use motivation is part of the way in which the user judges credibility. WELLNESS refers to eight components of wellness. The web site will be considered quality if all eight components are incorporated in the web site and the discussion is comprehensive, balanced and adequate. Health information should be considered by the user to be complete in order to make decisions and choices. A claim should have all the necessary elements such as claim assertions, evidence and authority, in order to back it up and for it to be logical.

7.2.4.6   *Content*

This is the material, menu, directional icons, bars, indicators, listing and indexes. It includes the text, graphics, tables, equations, audio and video, links, navigation, searches and calculations. It also includes site ownership, sponsorship, site viewing, payment and privacy, editorial content, review, timeliness of content, sources and navigational elements. The mission and goals of the web site are important. The information provided should match the goals and the mission. The use of terms and language should be appropriate for the intended audience. A clear direct style supports the perception of quality. Information should be appropriate to user profile, language, literacy and special needs.

7.2.4.7   *Set of criteria*

In order to encourage the user to be discerning, a set of criteria that can be used to assess quality of web sites, of resources and of information should be provided.   This could be the criteria used for selection of resources and for selecting links, as well as instruments or tools of evaluation or ways in which users can take personal responsibility for rating and assessment. Direction to trusted groups such as MEDLINE, MLA and AMA web sites can also support the user.

7.2.4.8   *Browsing and searching*

The searching and browsing capabilities of the web site are related to the task of the user and their perception of its quality.   Browsing is exploratory in nature with the absence of planning, goals or objectives, whereas searching is goal-directed in that the user requires specific information to fulfill an information need and solve a problem.   Health information seekers process health information on the Web by surfing and searching. In surfing, there is an experiential orientation involving peripheral processing, whereas in searching there is a specific interest in the search topic. Surfers are drawn to what is interesting and depend on serendipity, while searchers are goal, need and action oriented.   Involvement and motivation are aspects of identifying quality. Accessibility pays attention to guidelines on physical accessibility, as well as findability, searchability, readability and usability.

7.2.4.9   *Maintenance*

There should be accountability for the content and for the upkeep of the web site and an openness to evaluation of both. Transparency and integrity are important to the WELLNESS health information seeker.   Web attrition is a problem that health information seekers face. Veronin (2002:e10) found that when the URL address for an original set of 184 web sites was re-entered, 108 or 59% of these could not be found, 31 or 17% had moved to a new URL and 45 or 24% could be found from the original URL. The average life of a

web page is about 77 days. Four years signifies the seniority of a web site. Any indication that the web site is experiencing attrition is a question in the mind of the user about the reliability, relevance, accuracy, currency of the information and ultimately of the quality of the web site. Web sites require care and maintenance. They should grow and adapt to change. The accumulation of new content requires a constant re-examination of the organising principles. Publishing a web site should be done only when the attention that it will require can be given by the webmaster in terms of resources and especially time.

7.2.4.10 *Errors minimised*

Users expect as few errors in the content, as well as in the functioning of the site as possible. This is especially true if there are products or services to pay for. A large part of any interaction design project involves dealing with 'user error', namely what does the system do when people make mistakes, and what can the system do to prevent those mistakes from happening in the first place?

7.2.4.11 *Hyperlinks*

The external links, connections to other internal pages and external sites are critical to quality. However, the links should be evaluated in order to establish quality. Links need to be relevant and working. Dead links are an indication of web attrition.

7.2.4.12 *Design*

The elements and features of web pages can affect perception of their utility and are basic to usability. These include layout, interface, functionality, usability, ease of use and interactivity. The technology largely determines the quality of the interface in terms of the basic software and links, navigation, feedback mechanisms, a search function, site map, stability and accessibility of the web site, aesthetics and visual presentation, user support, terms and

language used. What the user experiences is the surface plane. It is at this level that decisions are made and motivation is increased or minimised. The Web requires high levels of user involvement and intrinsic motivation because users have to make choices, read and exercise control when moving through the material. Accessibility, presentation and design, as combined with the readability and comprehensibility of the content, are important quality factors. Usability is a key issue in the survival of any web site. Quality design principles support the statement of goals.

The web site quality factors identified in Figure 7.4 and discussed above were applied to the design of the prototype of the WELLNESS web site. Table 7.3 lists the quality factors. The application of these quality factors in the design of the WELLNESS web site is indicated. Reference is made to the relevant prototype slides included in Annexure three. Comments on the application of these factors in the development and implementation phases of the WELLNESS web site are made.

Table 7.3 Quality factors application to WELLNESS web site

Factor	WELLNESS web site	Slide	Comments
Authorship	• authority • authors, credentials & qualifications • references • physical address • name of host • contact information • editorial board • links to resources • policy of disclosure	11	• The database will include information about authors, their credentials and qualifications to establish authority and credibility. • Links will be provided to resources that have been selected using the selection criteria model.
Sponsorship	• identification of organisations, government agencies		• When sponsorship is obtained, the relevant organisation or agency will be clearly identified and acknowledged. • Recommendation and future research concerning sponsorship is discussed in Chapter eight.
Currency	• update date displayed • information up-to-date • publication, review dates		• The WELLNESS database-driven web site will be dynamic and automatically updated as changes are made. • A 'last updated' date will display at the bottom of each page to indicate when currency. • The information provider will provide review dates to indicate when resources were last reviewed for currency and completeness.
Credibility	• reliable, professional source • author experience, expertise • currency • site evaluation • design and interface • topic appropriateness and user-utility		• The model of selection criteria, together with the content selection criteria will be used to select WELLNESS sources and resources. • The WELLNESS health information seeker profile implications for design were considered in the prototype design and recommended for further use in the development and implementation of the WELLNESS web site for the design of a credible, user-centred, topic appropriate web site.
Completeness	• elements, steps, dimensions incorporated, balanced and adequate	1-10	• All components of WELLNESS were addressed.
Content	• material, text, graphics, tables, • site ownership • site viewing • confidentiality and privacy • mission and goal • menu • links	1-23	• The fully-functional WELLNESS database-driven web site will evidence the interrelationships between the design and content and how these elements support the WELLNESS health information user information behaviour.

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Factor	WELLNESS web site	Slide	Comments
	• navigational elements • audience appropriate language & use of terms • clear, direct style		
Set of criteria	• display of criteria to assess quality of web sites • availability of instruments, tools for rating & assessment	11	• Table 7.4 will be included on the 'About' page for web site quality assurance. Links to other tools and instruments will be provided. • The content selection and selection criteria models will provide criteria for user and information provider resource selection.
Browsing & searching	• supports browsing • supports searching • findability • searchability • readability • usability	Browse: 14-19 Search: 20-23	• Search and browse functions form part of each page to support findability, searchability, readability and usability.
Maintenance	• accountability for site • plans to keep web current		• The WELLNESS web site will not become fully-functional until maintenance and accountability are possible. • This will ensure currency, completeness and credibility.
Errors minimised	• few errors in content • site functions efficiently & effectively		• The design of the WELLNESS web site is intended to minimise errors to function efficiently and effectively. • Once it becomes fully-functional the content will be strictly controlled to ensure few errors. • The system will respond to the user by suggesting alternatives to facilitate access and retrieval.
Hyperlinks	• external links function • internal links function		• The model of selection criteria and content selection criteria will be used to determine inclusion or exclusion of links to other resources. • Regular link checks will be done to ensure currency. • Dead links will be removed.
Design	• design elements support user information need		• Design principles were used to design the prototype WELLNESS database-driven web site. • Further development and implementation requires the application of these design principles to ensure usability.

The relevant quality factors discussed above were used to select a quality assurance instrument for assessing health web sites. Godin, Truschell and Singh (2005:69) constructed and tested a quality assurance instrument to assess health web sites. This instrument was selected for use in this study to assess the quality of self-help health web sites and to apply the instrument in ensuring the quality of the WELLNESS web site. The criteria used were those identified in section 7.2.4.1-7.2.4.12. The instrument, Table 7.4, was adapted to be specifically relevant to the WELLNESS web site.

Table 7.4 Quality assurance instrument for web sites

Web site name:			
	Yes	**No**	**N/A**
1. Is a 'name, affiliation, credentials' of the author/s who developed the site listed?			
2. Does the site provide 'references, citations' for the user to access in order to substantiate the information?			
3. Does the site provide contact details or some way for the user to contact the webmaster if there is a need, e.g. 'contact us'?			
4. Is the site sponsored by advertising, promotion of products and services?			
5. Was there any indication of 'conflict of interest'?			
6. Does the site refer to financial support?			
7. Does the health portal provide a 'date of the most recent update'?			
8. Does it state a currency policy?			
9. Does the site provide evidence of professionally qualified authors of articles/narrative?			
10. Does it provide a disclaimer: 'designed to support not replace PCP services'?			
11. Does it provide a disclaimer stating that the content is 'general information', not 'individualised patient information'?			
12. Is there assurance for the user that his/her confidentiality is secured?			
13. Are 'links' provided to other sites?			
14. Do the links work?			
15. Is there an indication of a formal review process (peer-reviewed, editorial board etc.)			
16. Is the intended audience clearly indicated?			
17. Does the site allow for 'interaction' between the web site and user?			
18. Does the language suit the health literacy level of the audience?			
19. Is the site easy to navigate/use?			
20. Did the resource/s meet an information need?			
21. Did the site support an interactive format for lifestyle change in any/all of the 8 wellness areas (e.g. tips or stages to make change)?			

Authorship is important in terms of qualifications of the webmaster, professionals and contributors (Questions 1&9). The trustworthiness is substantiated by referencing information as well as claims and benefits cited (Question 2). Contact with the webmaster is important (Question 3). Any hints of sponsorship and conflict of interest should be addressed (Questions 4&5). Financial support is also an important issue (Question 6). Currency is important and up-dating policies support credibility (Questions 7&8).

Disclaimer statements about general use and the importance of the primary care professional are important (Questions 10&11). Confidentiality and privacy are important to the user (Question 12). Can additional information be accessed by links and do they work? (Questions 13&14). A review process helps to establish credibility (Question 15). The intended audience should be clearly defined (Question 16). Attempts at 'interaction within the site are important' (Question 17). The health literacy abilities of the user should be noted (Question 18). The navigation should be natural, effective and efficient (Question 19). The information need of the user is an important goal of the web site (Question 20). An interactive approach to the importance of lifestyle and change should be used (Question 21). Researchers agree that user evaluation of quality is at the centre of processing health information and decision-making (Dutta-Bergman 2004b:253).

The provision of instruments, ratings and links to other web sites that provide evaluation criteria convey to the user that the web site is credible in terms of transparency and integrity. Transparency supports the idea of quality and encourages the user to be discerning. The intention is for users to evaluate any and all of the web sites linked to the WELLNESS web site, as well as the WELLNESS web site itself.

7.3 PROTOTYPING THE WELLNESS WEB SITE

A prototype is a working model to develop and test design ideas, examine content, aesthetics and interaction techniques in order to identify usability problems at each stage of design (Walker, Takayama & Landay 2002).

Prototypes give a better impression of the user experience than simple descriptions. High-fidelity prototypes are usually computer-based and low-fidelity prototypes are paper- or computer-based. A high-fidelity prototype is often made with the same methods as the final product and has the same interaction techniques and appearance as the final product, but is more expensive and time-consuming to produce than a low-fidelity prototype (Preece, Rogers & Sharp 2002:245).

Comparison studies by Bailey (2005) and Walker, Takayama & Landay (2002) compared the low-fidelity prototype with the high-fidelity prototype with respect to usability testing. Bailey (2005) reported on a number of studies based on the assumption that the high-fidelity prototype is more effective in collecting a realistic picture of how the human performs. The findings confirmed that the two types of prototypes produced the same quantity and quality of user observation. Walker, Takayama & Landay (2002) found no difference. They therefore recommended the use of low-fidelity prototypes because of cost, ease of iteration, its participatory design and the support of testing in a dynamic and exploratory way. The focus of the designer can thus be concentrated on interaction design and IA.

Low-fidelity prototypes are useful as they are cheap, simple and quick to produce. This supports modification and exploration of alternative ideas and designs. It was recommended in Chapter one and illustrated in Figure 1.1 that a low-fidelity prototype be developed for the purpose of this study. A recommendation will be made in Chapter eight to develop a high-fidelity prototype after the development phase of the database is completed. The researcher did not develop a high-fidelity prototype because it would not have been possible to integrate the web site with the database at this stage. The researcher had to simulate the database-driven web site. Chapter eight will outline the next phase of development.

The use of a low-fidelity prototype enabled the designer to gather data from the user to test whether the web site would meet the expectations of the user. Storyboarding is an example of low-fidelity prototyping that is used in

conjunction with scenarios. A storyboard consists of a series of sketches showing how a user may progress through a task using the web site being developed. When used in conjunction with a scenario the storyboard provides more detail to the written scenario and allows role-playing with the prototype (Preece, Rogers & Sharp 2002:243).

Two scenarios were developed in section 7.2.3.2 and were the basis for representing the user executing a task, that of searching and browsing. The storyboard, based on scenario number 1 was a series of pencil sketches on paper. Its frames, containing screen sketches or shots, showed a limited amount of detail. The storyboard was shown to five users and their feedback was taken into account to develop the low-fidelity prototype. The storyboard has not been included. The wireframes in section 7.2.3.4 were based on the response to the storyboard. The wireframes were shown to the users for feedback on the IA and navigation. Ordering and layout were deemed to be most relevant in this stage of the design process. Less attention was given to the aesthetics of the design.

The focus was on the sequence of steps the user would experience when interacting with the web site to find WELLNESS information and select resources. The general layout was important rather than a detailed presentation of the content. The task analysis in section 7.2.3.2 was helpful in determining how the storyboard should be developed to represent the activities found in the scenario.

The researcher made the decision to use Microsoft PowerPoint software to develop the prototype. The software is widely used and comes standard on most computers. Harris (2006), in a discussion with bloggers concerning prototyping with PowerPoint, found that PowerPoint is used widely in the Web and user interface design industry to develop prototypes. Using PowerPoint in place of a hand-drawn paper prototype creates a more realistic prototype. The advantages of using this technique are that the prototype can be made to feel somewhat interactive, the content is electronic and can therefore be modified more easily than paper. It is easier to make changes to the design in

PowerPoint without having to redo an entire screenshot. Using PowerPoint allows the designer to put different screenshots in different slides. The slide master option allows for static frames to be put into the slide master background so that progressions can be noticed. Interactivity is supported by the addition of action settings which allow for a sense of interactivity for the user.

The PowerPoint prototype was designed and the various screenshots were printed and shown to users for their feedback. The screenshots represented a sequence of tasks through which a user would progress. The scenarios and the task analysis based on these scenarios in section 7.2.3.2 were used to develop the PowerPoint screenshots. Not every screenshot for every possible task was included. Searching and browsing tasks were represented. The labels of the categories correspond to the eight components of wellness that combine to form the WELLNESS acronym. The browse function was located on the left hand side of the page. This followed the conventions of similar web sites. It is also the location for navigation options in/on many sites. The banner found on every page informs the user as to the web site that they are visiting. Every page includes a header which indicates to the user where they are in the web site. The category in which users currently are is also indicated on the left-hand side of the page in the top left-hand corner.

In order to prevent user frustration in finding the information they are wanting, the layout and display of information is designed to be uncluttered with little background noise and busyness. The content is limited to the viewable area of the screen and does not require the user to scroll. The purpose of this is to provide clear information. The exception to this is the results screens, which provides a list of resources by category. Scrolling is necessary in this case as users wanted to know what was available and wanted to sift through the lists. Clickable options and links were made visible and obvious. Options were provided for the user to click on instead of having to enter text in a search box. This reduced user errors and made it easier for users to use the site. Entering the subject, topic or author's name in the search function was the

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only item that the user had to enter in the search functions of the information gathering stage.

The WELLNESS prototype was shown to five users to receive informal feedback. In response to their analysis, the search function location on secondary pages was moved to the centre of the page for consistency and for matching the layout on the homepage. To show that the left-hand column is clickable the convention of using blue, underlined text was used. The disclaimer on the 'About' page was revised on the advice of a health professional. The revised WELLNESS homepage is depicted below in Figure 7.5.
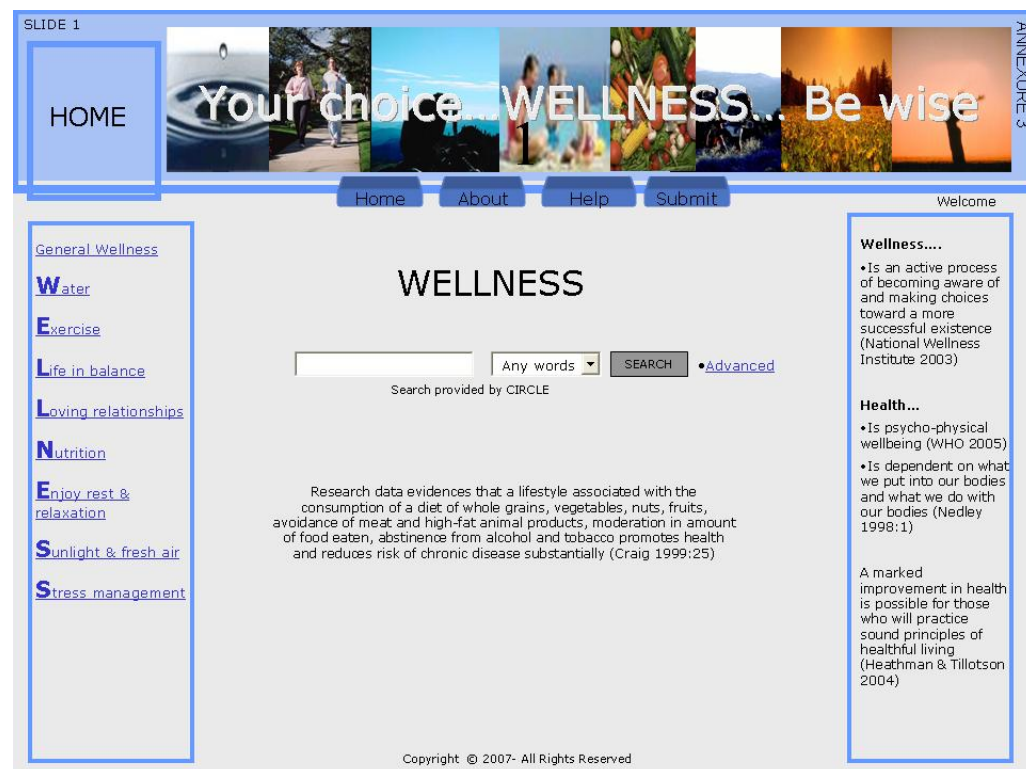
Figure 7.5 Homepage of WELLNESS web site

The browse option screenshots based on scenario number 1 are shown in Figures 7.6 – 7.11

Figure 7.6 Browse option – Slide 14
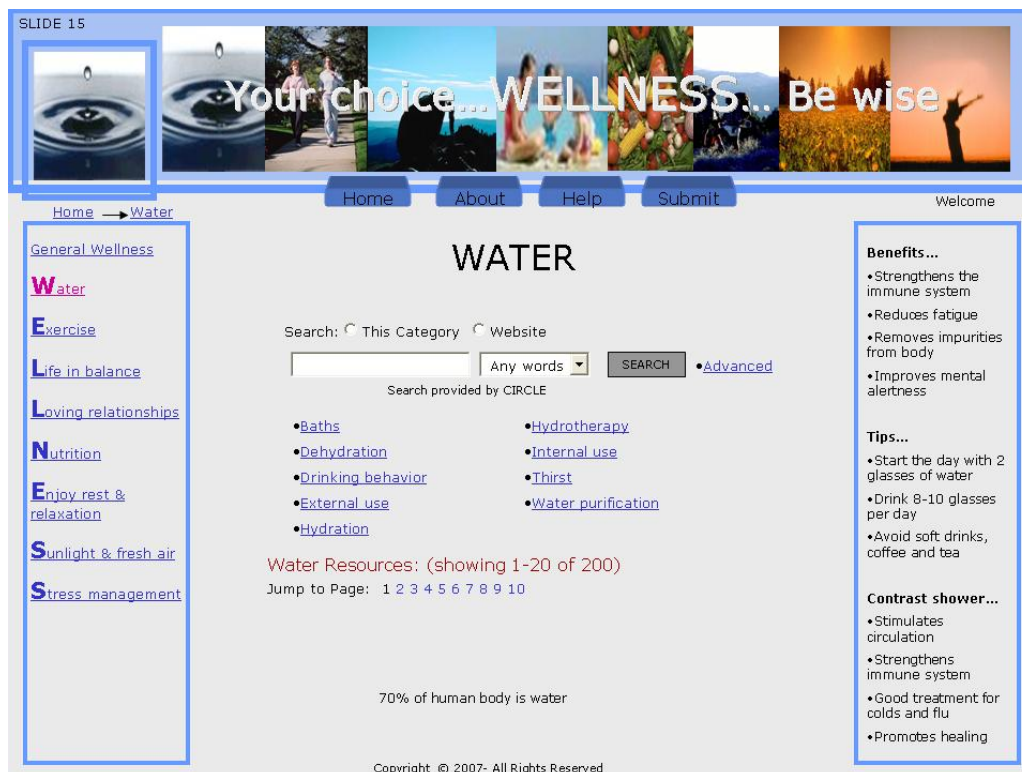
Figure 7.7 Browse option – Slide 15
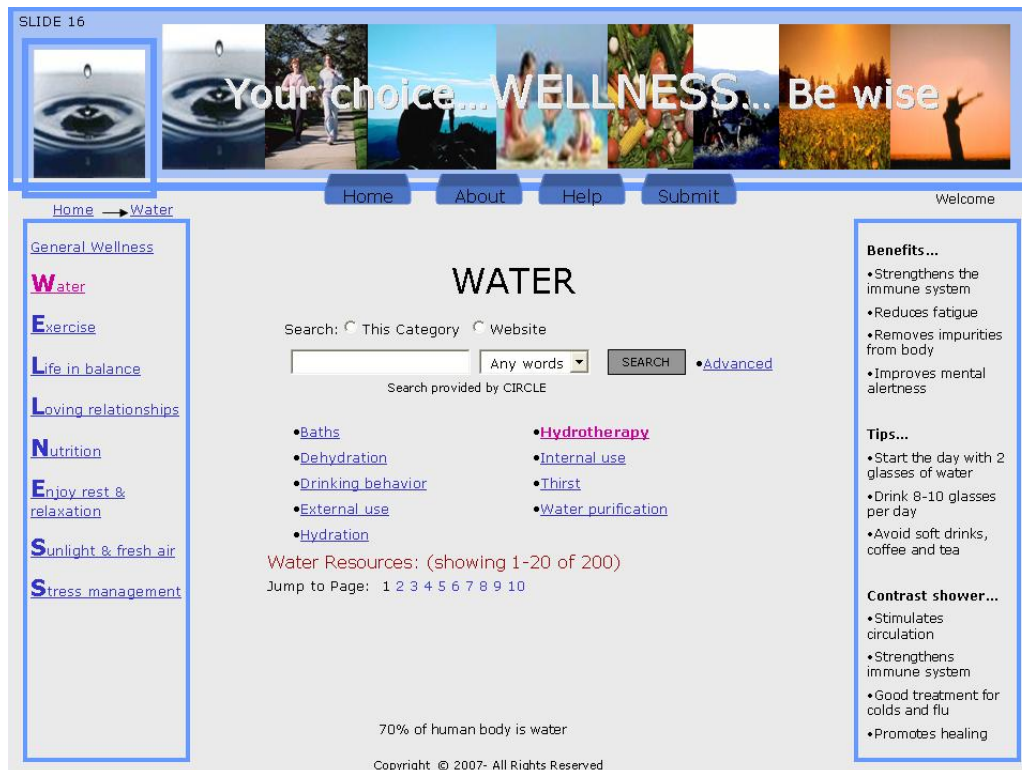
Figure 7.8 Browse option – Slide 16
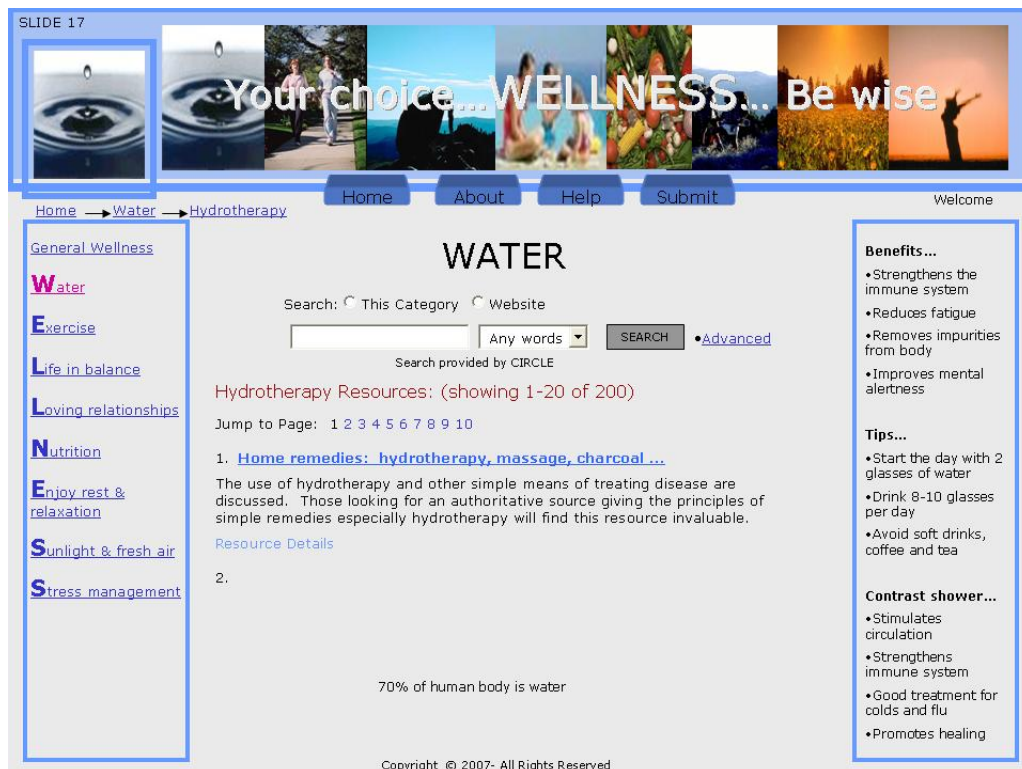
Figure 7.9 Browse option – Slide 17
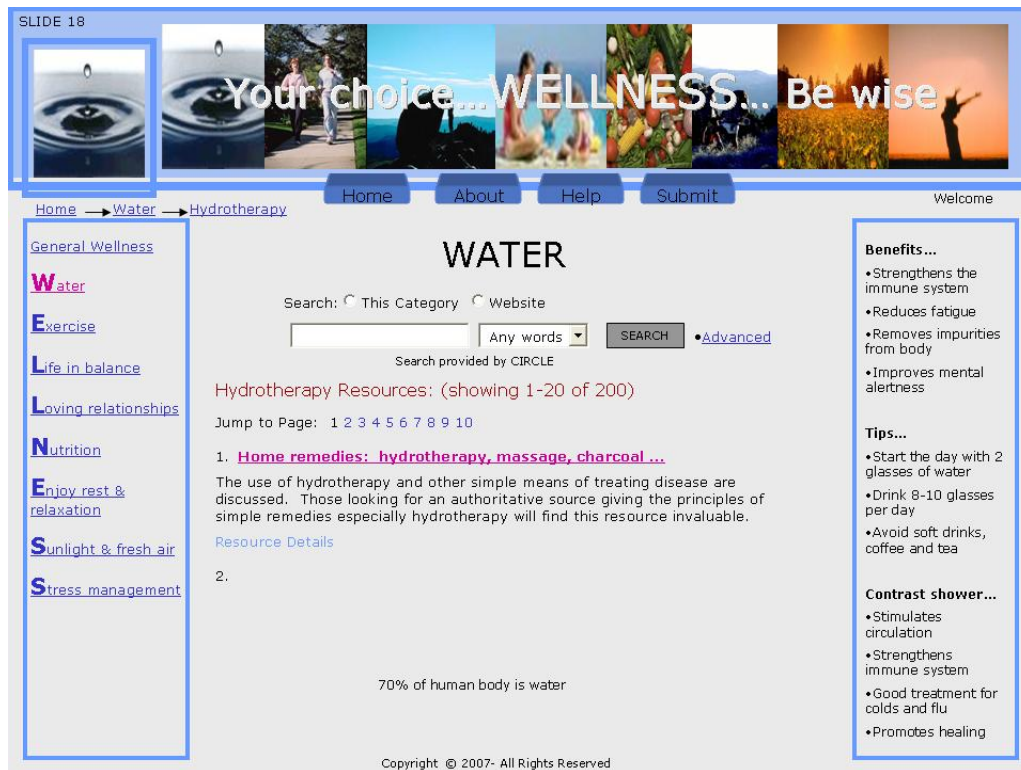
Figure 7.10 Browse option – Slide 18
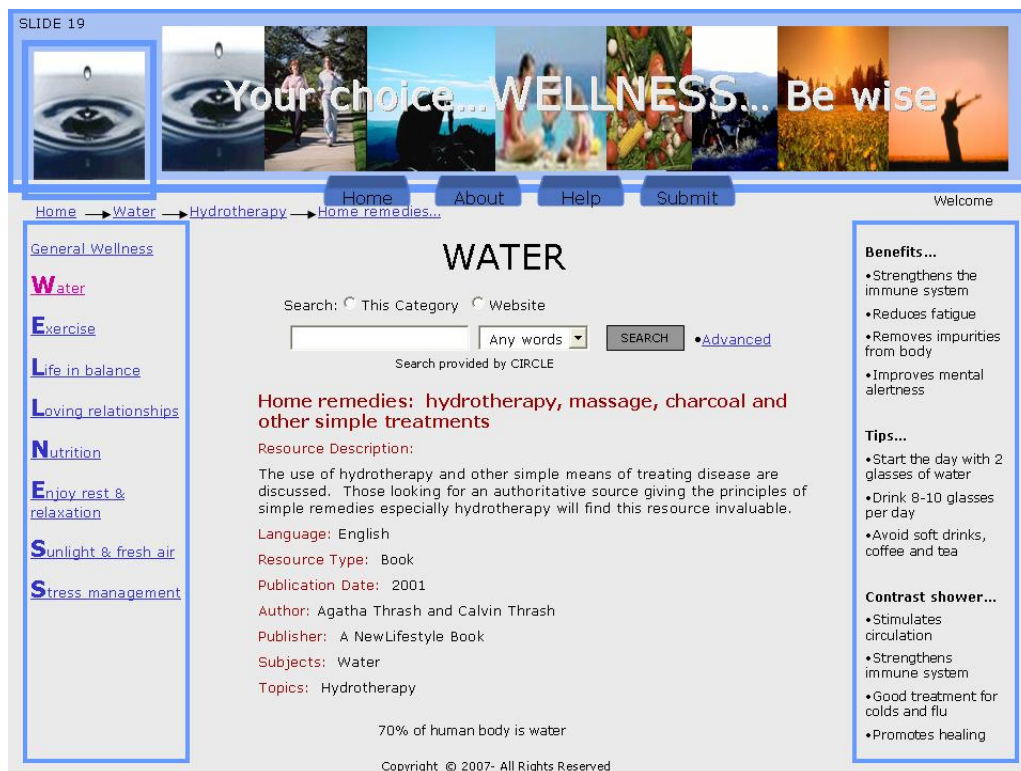
Figure 7.11 Browse option – Slide 19

Annexure three includes the following screenshots:

- slides 3-10 - WELLNESS categories, that is water, exercise, etcetera

- slide 11 - About

- slide 12 – Help

- slide 13 – Submit

- slide 14-19 – Browse option – example Water

- slide 20-23 – Search option – example Hydrotherapy.

The 'Help' and 'Submit' features will be integrated with the CIRCLE database to make them functional. Chapter eight will discuss this phase of the development.

Chapter eight will recommend that the 'Search' and 'Advanced Search' functions of the WELLNESS web site will piggyback on CIRCLE's search function.

7.4 WELLNESS WEB SITE EVALUATION

User-centred design is an iterative process. All the aspects of the design strategy were evaluated against the user needs and requirements of the WELLNESS web site. Evaluation began with the identification of the user needs and requirements which were basic to the design process. Existing health web sites were evaluated in section 7.2.2 to establish the need for the WELLNESS web site, as well as the conventions, content, the IA, elements of design, navigation and principles of design used in this type of web site. The conceptual model consisted of requirements, usability, IA, navigation features and principles and elements of design. The requirements by which to evaluate the web site were identified in section 7.2.3.1. The functional, data, environmental and context of use, user and usability requirements formed an integral part of the design. The ease with which the user uses the web site, that is usability (section 7.2.3.2), is critical to user-centred design and is an important aspect of the design. IA (section 7.2.4.3) is the structure of the web site. Evaluation determines whether the design will support searching and browsing, facilitate intuitive access to content and the completion of the task. The navigation features (section 7.2.4.4) form part of the IA and support the user in accessing the content of the web site. Evaluation of the navigation features assesses whether the user needs and requirements have been met.

Principles and elements of design (sections 7.2.4.5 and 7.2.4.6) were applied in the prototype.

Prototyping is a way of testing and evaluating ideas before the final layout and content are in place. The WELLNESS web site prototype was designed in this chapter. Evaluation will determine whether the design process incorporating the design factors discussed above resulted in the design of a WELLNESS web site that would meet the needs and requirements of the WELLNESS health information seeker and support their searching and browsing activities with reference to access to WELLNESS health information resources. As shown in Figure 1.1, further development and implementation of the WELLNESS web site is beyond the scope of this study. Chapter eight will recommend that an evaluation of the prototype WELLNESS web site be undertaken for further development and implementation resulting in the database-driven WELLNESS web site. An evaluation instrument was developed in this study for use in the development phase.

The two forms of evaluation that have relevance for user-centred design are heuristic and formative evaluation. Heuristic evaluation evaluates the user interface and its usability through the use of a set of heuristic principles as a checklist. Heuristic evaluation is informal and a subjective way of analysing usability. It involves three to five evaluators who examine the user interface of an interactive product. They use their experience of intended users and tasks to identify possible problems (Zabed Ahmed, McKnight & Oppenheim 2006:159). Heuristic evaluation is beneficial in early prototypes before actual users are brought in to help with further testing. Design feedback provided by heuristic evaluation is valid and useful. Evaluators use the heuristic principles to go through the interface independently. The evaluations are then combined to obtain the results. The advantages of heuristic evaluation are that it is quick, simple to use, requires a few evaluators and is intuitive. It is not intended to use 'real' users. It is reliant on the skill and expertise of the evaluator.

Formative evaluation is a means of evaluation in which the areas to be modified in educational materials are identified by means of the collection and analysis of data from a target population (Schnackenberg, Chin & Luppicini 2003:103). Formative evaluation includes users early in the design process and ensures usability of interaction design iteratively. The evaluators are real users and may uncover usability problems that an expert evaluator performing heuristic evaluation may be unaware of. Formative evaluation techniques that assess learning are often used to investigate user knowledge gains. While it is important to evaluate this aspect of a web site, it is also necessary to investigate the functionality of the web site.

Heuristic and formative evaluations do share similar goals such as:

- both use surveys, observation, interviews and other techniques and instruments to collect data collected from a target population
- both make recommendations about modifications to something, that is to a specific product or material in the design and to development phases of a creation
- organisation of content
- speed of access and use of system
- navigation links
- levels of ability
- technical aspects
- visual display.

Despite their similar goals, formative evaluation however does not focus on the correspondence between system language and context and target population, availability of user control and freedom, consistency in standards and platform conventions, and freedom from errors as heuristic evaluation does. Heuristic evaluation was selected over formative evaluation as it focuses on the usefulness of a product, that is the user interface or navigation issues, as opposed to focusing on instruction and learning strategies such as pretests and posttests.

Based on the fact that the usability of the WELLNESS web site is the focus the researcher selected heuristic evaluation as the evaluation method. An heuristic instrument (*Suggested heuristics for web sites…* 2000/2001), included as Annexure four, based on Nielsen's list of heuristic guidelines, was selected because it incorporated the principles of usability suitable for the evaluation of a web site for all types of users.

7.5 CONCLUSION

The focus of this chapter was the design of the prototype WELLNESS web site. The various factors involved in the design of a web site were researched and applied practically in the development of the low-fidelity prototype web site. The criteria by which to measure web site quality were enumerated and a quality assurance instrument for health web sites was adapted for use in web site evaluation. An heuristic evaluation instrument was chosen for the evaluation of the prototype. Chapter eight will recommend that the heuristic evaluation instrument be used in the development phase once the web site has been integrated with the database with CIRCLE as host.

Chapter eight will conclude this study with the conclusions drawn and recommendations made for further study and research.

CHAPTER EIGHT

CONCLUSION AND RECOMMENDATIONS

8.1 INTRODUCTION

The purpose of this concluding chapter is to summarise the findings of the research project and to correlate these with the purpose and the objectives of the study as stated in Chapter one. The problem statement is contextualised. The methodology as proposed in Chapter one is reviewed. The findings of the literature analysis will be interpreted and the implications of these findings for the development of a reference database of health information resources to facilitate informed lifestyle choice will be discussed. Recommendations will be made for further study and possible future areas of research related to this study will be proposed.

8.2 PROBLEM AND ITS CONTEXT

This study was a continuation of the original study (Steyn 1999) in which an extended model of database design was proposed for development. However, the growth of the Internet and impact of the Web on health information-seeking behaviour changed health information delivery systems which had significant implications for the design process. The extended model, as set out in Annexure one, proposed a software-based, stand-alone database with limited access and availability. A decision was made to design a database-driven web site as health information resources could be made available on a worldwide scale. A new model of web site development was proposed in Chapter one, Figure 1.1, with the design phase the focus of this study. The interrelationship between the user, the resources and the tool was researched.

In order to develop a reference database of health information resources to facilitate informed lifestyle choice, the need for health information had to be

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established. An investigation of the paradigm shift within health and the emergence of a new worldview that characterises the current health care situation was therefore undertaken to establish the need for health information. Within this context, the researcher observed an increase in the use of the Web for health information by health information seekers. The paradigm shift from the dominance of conventional medicine to the rise in interest in CAM has resulted in individuals taking personal responsibility for their own health and wellness. This orientation has influenced health information-seeking behaviour and impacted user need. It was established that the provision of information to make rational lifestyle choices can significantly contribute to the reduction of the worldwide epidemic of chronic disease. These findings have highlighted the importance of a database-driven web site that approaches health from a perspective that includes the components of a specific approach - WELLNESS. The WELLNESS web site is intended to make WELLNESS health information available and accessible to support the global initiative to reduce the burden of chronic disease and promote prevention strategies, wellness initiatives and lifestyle choice.

Within this context, the WELLNESS approach is a framework based on research of the components of a healthy lifestyle that both promotes health and wellness and prevents disease. The acronym WELLNESS was introduced in section 2.2.4 to identify a specific approach to wellness consisting of eight components, namely water, exercise, loving relationships, life in balance, nutrition, enjoying rest and relaxation, sunlight and fresh air, and stress management. This framework for WELLNESS, discussed in Chapter four, is the approach to wellness advocated in the worldview and orientation to health of the SDA church. It is a lifestyle adopted and practiced by a large majority of its members worldwide. The eight components that comprise the acronym were used to form the framework for the following: a specific approach to wellness; the profile of the WELLNESS health information seeker; criteria for the selection of resources; thesaurus construction; database design and web site design.

The group of users who go online seeking health information have become known as health information seekers. This group was investigated in the context of their health need, characteristics and information-seeking behaviour. These aspects were taken into consideration when profiling the WELLNESS health information seeker who seeks WELLNESS resources to make decisions about lifestyle and wellness was profiled. In order to develop a user-centred database-driven web site that will meet the criteria of usability, the user as WELLNESS health information seeker was profiled in Table 3.9.

The purpose of the WELLNESS web site was to organise WELLNESS resources to meet the WELLNESS health information seeker need, requirements and preferences. It was established that the health information seeker goes online for health information. The Web is a preferred resource because of its support for convenient and personalized access. The Web makes vast amounts of regulated and unregulated information available. One cannot assume that the nature of the Web will automatically support health information-seeking behaviour. The problems related to the Web were investigated to highlight the need for a specific web site as a WELLNESS resource. These problems also highlighted the need for specific WELLNESS resource selection criteria to be used in the evaluation and selection of the content of the web site. These criteria were identified in the context of a five-dimensional model that emphasised the importance of science, worldview, history, wholism and discernment. These criteria will be used to ensure that quality, credible and scientifically based or proven resources are made available to meet user needs and requirements.

The increased interest of the health information seeker in accessing health information on the Web highlighted problems in the search for and retrieval of relevant resources. These include levels of health literacy, scientific literacy, vocabulary and terminology. The researcher constructed a WELLNESS thesaurus, a preferred indexing tool for digital resources, to overcome the vocabulary gap between the user and the health information that will be provided as well as to ensure consistency, standardisation of terms and vocabulary control.

The decision made to provide access to WELLNESS health information resources on the Web influenced the shift from a software-based to a Web-based database. Identified database host options were compared according to a set of criteria to select a database host compatible with the conceptual schema developed by the researcher in the original study. The WELLNESS web site will serve as the interface between the WELLNESS health information seeker and the database of WELLNESS health information resources. The design was user-centred and iterative to meet WELLNESS health information seeker needs and requirements.

Research confirmed that this was a unique research study in that the framework for making WELLNESS resources accessible reflected an orientation not currently available on the Web. Additionally, the health information seeker had not been profiled as the WELLNESS health information seeker. A model of resource selection criteria within the WELLNESS framework had not been developed. A thesaurus applicable to the WELLNESS framework was also not available. The design research process required that constructs, models and method were identified, adopted and adapted to inform the process.

In section 1.4, the following questions incorporating the user, resources and tool formed a framework for the study:

- who is the WELLNESS health information seeker and what is their information need?
- what resources will be selected in order to meet the WELLNESS health information seeker need and requirements?
- how will the tool be designed to make WELLNESS resources accessible and available to satisfy the WELLNESS health information seeker's information need?

The following issues emerged as sub-problems that were also addressed:

- what is the relevant body of information concerned with wellness and more specifically the information that undergirds the WELLNESS approach?

- which criteria are relevant for the purpose of selection of WELLNESS information resources?

- what is the most appropriate medium for mapping the conceptual schema?

- what vocabulary will be used to compile a thesaurus to facilitate retrieval and accessibility?

- what is user-centred web site design?

- how can the database-driven web site contribute to the credibility of the WELLNESS approach to wellness and health?

- how can health information resources contribute to a more informed society by supporting informed lifestyle choice?

The intent of this chapter is therefore to summarise the findings of the preceding chapters to answer the questions raised in the problem statement. However, it is important to first clarify the methodology used in this research project to ensure its credibility and the validity of the findings.

8.3 METHODOLOGY

It was important to discuss the research methodology of this study in relation to the research methodology of the original study (Steyn 1999) as set out in Annexure one. The research matrix in Table 1.1 reflected the research methods used in both studies. These consisted of traditional qualitative and quantitative research methods, literature analysis and the emerging research method, namely design research.

In the context of this study, an important distinction must be made between design and design research. The prototype WELLNESS database-driven web site is not just a new artifact or product. It is the result of a process and was informed by a methodology, namely design research in which new knowledge

has been produced that is presumably interesting to the relevant community of scholars. The significance of this study was that the user was defined in a new context as the WELLNESS health information seeker. Health information resources were identified within a specific framework, namely WELLNESS. This required the identification of content selection criteria within a five-dimensional model to select WELLNESS resources. A WELLNESS thesaurus based on a combination of relevant thesauri was constructed and is included as Annexure two. An investigation of existing health information web sites highlighted the importance of designing a specific database-driven web site dedicated to WELLNESS resources to facilitate informed lifestyle choice. The anticipated consequence of this research effort is the provision of WELLNESS health information resources to facilitate informed lifestyle choice and thus make a contribution to the reduction of the global burden of chronic disease.

8.3.1 Extensive literature analysis

The literature was analysed to determine the following:

- related research projects to establish the justification for this research project
- clarification of concepts
- the current health care situation and the emergence of a new worldview
- user information needs, requirements, characteristics, information-seeking behaviour
- profile of the WELLNESS health information seeker
- to develop a model of selection criteria
- to identify criteria for WELLNESS web site content selection
- model of thesaurus construction
- the Web context for the database
- choice of database host
- web site design

- to identify the principles and elements of web site design

- design the prototype WELLNESS web site

- select an heuristic evaluation instrument.

8.3.2 Focus groups

The researcher consulted Craig (2006) for permission to use the acronym WELLNESS for the purpose of this study as used in Craig (2005b). Consultations with health professionals reflecting the WELLNESS approach assisted the researcher in the identification of selection criteria to be used in the choice of WELLNESS resources, as well as informing the design process.

A focus group of three information professionals were consulted during the construction of the WELLNESS thesaurus. These professionals provided advice, helped to delineate the process and helped the researcher choose among terms for inclusion or exclusion from the thesaurus. They helped to develop the hierarchy, standardisation of terms and relationships between terms.

The researcher had discussions with CIRCLE Directors' of Operations and Technology about mapping the conceptual schema to the CIRCLE database and the possible modifications and refinements to be made.

In section 7.3, a focus group consisting of five WELLNESS health information seeker users were shown the storyboard. Their feedback was taken into account in developing the low-fidelity prototype. The wireframes in section 7.2.3.4 were also shown to these users which provided feedback on the IA and navigation.

8.3.3 Adoption and adaptation of models and instruments

The research matrix presented in Chapter one, Table 1.1, outlined the research steps to be used to construct a thesaurus (chapter 5), develop a model of selection criteria (chapter 4), design the prototype database-driven web site (chapters 6&7) and choose an heuristic instrument (chapter 7). The

literature was researched to identify possible models and instruments to be adopted or adapted to inform the process of construction and/or design.

Using the methodology described above, the researcher sought answers to the questions raised in the problem statement and sub-problems. The findings and the issues raised should therefore be discussed.

8.4 FINDINGS

The researcher, as information professional, established that this study had epidemiological, philosophical, epistemological, sociological and psychological relevance. The opportunity, as information professional, to respond to the emergence of a user group characterized by their need for health information to make informed lifestyle choices within the current health care context, was identified. The various aspects of relevance highlighted the multidisciplinary nature of information science. This study required research on the interrelatedness of the user, resources and tool.

In this section, answers to the questions raised in the problem statement and sub-problems in section 1.4, and restated in section 8.2, are discussed.

8.4.1 WELLNESS health information seeker

A profile of the WELLNESS health information seeker and their information need was addressed:

- who is the WELLNESS health information seeker and what is their information need?

The 'user' had to be identified and profiled and their information need determined to inform the design process. The question stated above was contextualised and the following aspects were researched:

- the user need for access to health information
- the current health care situation and the emergence of a new worldview
- the impact of technology on the user and the provision of access to health information
- the emergence of a user group, that of health information seekers.

It was identified in section 2.2 that a shift has taken place in health care, from the old paradigm or old worldview, in which conventional medicine was dominant, to a new paradigm and emerging worldview in which the base of conventional medicine has been broadened to integrate other systems, practices and worldviews. These include CAM, HP, disease prevention and wellness emphasising the need to take personal responsibility for one's health and wellness. In the old paradigm, the burden of responsibility for one's health lay mostly with the practitioner, whereas in the new paradigm the responsibility has shifted to that of more personal responsibility and informed choice for one's own health and lifestyle and empowerment. Together with these shifts, the global burden of chronic disease is increasingly being linked to risk factors resulting from personal lifestyle choices. These factors have impacted the user of health information who is encouraged to become an active participant in his/her health and well-being. Quality health and wellness information that is relevant and credible to make informed lifestyle choices is required.

The comparative analysis of the main elements of conventional medicine and CAM, in Table 2.2, identified that the CAM approach is congruent with a worldview in which lifestyle and informed choice is promoted. Prevention and reversal of disease were linked. The CAM approach to health evidences a range of beliefs and worldviews in which holism is valued. Health is recognised as respecting the laws of nature. Simple factors such as lifestyle choices, which influence one's health, are promoted. It was important to identify a particular approach to health within CAM that characterised a state of optimal health in which there is a balance of the physical, emotional, social,

spiritual and intellectual components of well-being. Wellness was the framework for identifying principles of health and within which the WELLNESS approach was defined.

Research evidenced that the use of the Web by health information seekers to find health information is an established practice. Health information seekers are a general group of users interested in accessing and using health information. Health informatics, specifically CHI, is an informatics response to the consumer need for health information. Choices concerning health are becoming more difficult due to the abundance of regulated and unregulated health information available on the Web. It was found that the WELLNESS health information, by which the WELLNESS health information seeker can make personal informed lifestyle choices and take personal responsibility for his/her own health, has not been selected and organised in a way that it can be of use. The nature of the Web is complicated. Even though it offers numerous advantages for those seeking health information, its problematic nature often disadvantages the user seeking health information. Research highlighted that the information professional with expertise in the WELLNESS approach should be responsible for the development of the database-driven WELLNESS web site.

The profile of the WELLNESS health information seeker, a specific user group of health information seekers, was established by combining the attributes of the user identified from the user model and user survey information in the original study (Steyn 1999) with the information on the health information seeker. The information need, search behaviour and characteristics of the health information seeker within the current health care context and Web context informed the establishment of the profile. The specific characteristics, information-seeking needs and behaviour of the WELLNESS health information seeker were identified, as well as the implications for design of the database-driven WELLNESS web site. The WELLNESS health information seeker requires health information to satisfy their information need and to enable them to make personal informed lifestyle choices. The focus of this health information need is WELLNESS information. With the provision of

access to WELLNESS health information resources, the WELLNESS health information seeker is empowered to take responsibility for their own health and well-being. They are able to make personal choices about their lifestyle and the reduction of risk factors related to chronic disease.

The purpose of this study was to support the WELLNESS health information seeker within the current health care context with the design of a prototype database-driven WELLNESS web site that would make WELLNESS resources available and accessible. The resources - WELLNESS resources - to facilitate informed lifestyle choice are discussed.

8.4.2 WELLNESS resources

The problem statement and the sub-problems addressing the content of the database-driven WELLNESS web site are restated as follows:

- what resources will be selected in order to meet the WELLNESS health information seeker need and requirements? What is the relevant body of information concerned with wellness and more specifically the information that undergirds the WELLNESS approach? Which criteria are relevant for the purpose of selection of WELLNESS information resources? How can health information resources contribute to a more informed society by supporting informed lifestyle choice?

Specific health and wellness information, that is WELLNESS health information, by which the user, as WELLNESS health information seeker, can make personal informed lifestyle choices and take personal responsibility for their own health, is required. There is a growing body of information that supports the WELLNESS approach, but the researcher identified that there was no organised collection of this body of information, nor a mechanism for organising it. It was necessary to define and delineate the scope of the WELLNESS approach and then design the database and web site which would make WELLNESS resources available and accessible.

The WELLNESS health information seeker profile established the need for WELLNESS resources by which to make informed personal lifestyle choices. The WELLNESS health information seeker requirement was for quality, credible and proven WELLNESS health information. Section 4.2 outlined the WELLNESS resource framework for the purpose of identification, selection and organisation of appropriate resources that meet the selection criteria established to form the content of the WELLNESS web site. Information sources and resources reflecting the eight components of WELLNESS and related topics form the structure and content of the WELLNESS web site. The WELLNESS framework provides a specific focus for both the information provider and the WELLNESS health information seeker delineating the information resources to be selected. Resources that reflect the WELLNESS approach and that fit within the WELLNESS framework fulfill the WELLNESS health information seeker need and requirement.

For WELLNESS resources to meet the stated need and requirements of the WELLNESS health information seeker, as well as to address various problems associated with the identification, selection and provision of WELLNESS resources, a model for selection criteria was developed. The establishment of selection criteria met the user requirement for relevant, quality, credible and scientifically proven resources in the context of their worldview that emphasises wholism. A model of selection criteria incorporated five dimensions as a framework by which to evaluate medical/health practices and systems. These dimensions include science, worldview, history, wholism and discernment. As a discerning, rational individual, the WELLNESS health information seeker will use these five dimensions to determine whether the source or resource found on the WELLNESS web site or elsewhere correlates with their worldview and is appropriate for making an informed lifestyle choice. The information provider will examine each resource according to these five dimensions to make decisions about its inclusion or exclusion on the WELLNESS web site. The worldview of the resources should reflect the worldview of the WELLNESS approach, be scientifically based, be credible from the perspective of the history of the approach and support a wholistic approach. Discernment infers

the idea of selection. If the resource is in contradiction with the model and the set of selection criteria, the resource will not be selected.

The criteria for selection of quality WELLNESS content included reliability, relevance, credibility, currency, objectivity, authorship, sponsorship, audience, coverage, factual information, purpose and accuracy. The intention of publishing the criteria for selection is to support the discernment of the user to ensure that the database-driven WELLNESS web site will meet the WELLNESS health information seekers needs, requirements and preferences.

The provision of access to WELLNESS health information resources will support the WELLNESS health information seeker in his/her search for information to make personal informed choices, take personal responsibility for his/her health and well-being and be empowered as a responsible member of society. Providing access to WELLNESS health information resources in a database-driven WELLNESS web site is intended to facilitate and support informed lifestyle choice. Access to WELLNESS resources will make the individual user aware of risk factors that contribute to the chronic disease burden, help promote health and wellness, prevent disease and potentially result in behaviour modification and the reduction of risk factors. This would contribute to a more informed and healthy society.

The tool by which the WELLNESS resources will be made available should be discussed.

8.4.3 WELLNESS thesaurus and database-driven WELLNESS web site

The problem statement and sub-problems concerning the tool are restated as follows:

- how will the tool be designed to make WELLNESS resources accessible and available to satisfy the WELLNESS health information seeker's information need? What is the most

appropriate medium for mapping the conceptual schema? What vocabulary will be used to compile a thesaurus to facilitate retrieval and accessibility? What is user-centred web site design? How can the database-driven web site contribute to the credibility of the WELLNESS approach to wellness and health?

Research showed that the Web is preferred, by the health information seeker, for accessing health information. The problem identified was the lack of an organised collection of credible, quality and proven WELLNESS resources made available on the Web. The researcher therefore investigated the use of a database-driven web site to make resources available. A database-driven web site would utilise the technology of the Web together with the database designed in the original research. The database-driven web site will be available 24/7 worldwide, accessed by users at their convenience and provide a collection of resources housed in one location. A choice was made between a software- and a web-based database. Research identified that a database-driven web site would meet the criteria of the user and be the best solution for making WELLNESS resources available and accessible.

A database-driven WELLNESS web site was developed to facilitate the organisation, representation and retrieval of WELLNESS information. The database to be developed will consist of entities, their attributes and the relationships between the entities which will be described consistently. The development of a reference database was preferred above a source database as the Web and its linking capabilities has expanded the concept of a reference database to include much of what a source database provides. Potentially it can function very similarly with hypertext links often providing access to the actual source. A web-based database host will be used to store and retrieve WELLNESS information.   Possible database hosts were compared and CIRCLE was chosen as the platform best suited for the mapping of the conceptual schema. A web site will facilitate access to WELLNESS information stored in the database.

The field of study for the research project had to be delimited. A database-driven web site development model was therefore developed (Figure 1.1). The study delimited to the design phase of a database-driven web site. The choice of a database host, assessment of the mapping of the conceptual schema to the selected database host and the design process of a web site were included in the design phase. The user is central in user-centred design and the problems users experience in completing their tasks is taken into consideration. The WELLNESS health information seeker profile informed the design process.

The design of a database-driven web site is a complex process. It begins with stated needs and requirements and results in a database-driven web site which is implemented and has to be maintained, evaluated and continuously updated. The researcher therefore concentrated on the design of a low-fidelity prototype database-driven web site. A low-fidelity paper-based prototype allowed the researcher to test the web site design with a focus group and make the necessary modifications to ensure usability and user-centred design.

One of the stated user requirements in the original study (Steyn 1999:129) was for subject access to WELLNESS resources. Subject vocabulary control was an important aspect to consider in the design of the tool which would serve as an indexing and searching tool. The researcher made a decision to construct a thesaurus which standardised the use of subject descriptors to describe resources for the WELLNESS approach. Various models for thesaurus construction were compared and a model outlining nine stages was developed. The construction of the WELLNESS thesaurus bridged the gap between the WELLNESS information source and the WELLNESS health information seeker information need. The thesaurus will support search and retrieval activities. The construction of the WELLNESS thesaurus ensured consistency and standardisation in terminology, provides an access point to WELLNESS resources, shows relationships between terms, supports indexing and information search and retrieval.

Possible sources of standardised word lists in subject related fields were considered. Macro thesauri HE and MeSH, as well as LCSH and ERIC were discussed and compared to determine their suitability for extraction of terms and use in the construction of the WELLNESS thesaurus. The WELLNESS thesaurus was constructed using the eight components of WELLNESS as the basis for compilation. The construction of a thesaurus is an on-going process and is an essential aspect of the database-driven web site.

This research project reinforced the need for the database-driven WELLNESS web site on the Web for use by WELLNESS health information seekers as they search for WELLNESS health information resources to make informed personal lifestyle choices. The organisation and representation of WELLNESS resources on the Web, as a specific approach to health and wellness, was shown to be a relevant and useful approach to health and wellness in the rapidly changing and expanding world of health information. A database-driven web site of resources for WELLNESS will centralise and organise this specific collection of WELLNESS information and information about entities. These resources will be available and accessible on a worldwide scale. This will contribute to the credibility of the WELLNESS approach to wellness and health as more health information seekers will be able to access this information and potentially use it to make informed lifestyle choices and behaviour change. The potential of the provision of WELLNESS health information to contribute to the reduction of the global burden of chronic disease was worthy of consideration. The selection criteria model was established so as to only include those resources which meet the stated criteria, that is, only quality, credible, scientifically proven resources. The construction of the WELLNESS thesaurus provides subject access to the selected resources. A database-driven web site model was developed to include those steps necessary for the design of the prototype database and web site. The model delimited the study to that of the choice of database host and assessment of mapping of the conceptual schema to the host and web site design. The WELLNESS health information seeker profile informed the design process. The prototype database-driven WELLNESS web site was designed to store and organise WELLNESS information and make it

accessible in a user-centred design. The user, the resources and the tool were the focus of this study.

8.5 RECOMMENDATIONS FOR FURTHER STUDY

Recommendations for further study include the development of the web site prototype and database to the implementation of a fully-functional database-driven WELLNESS web site; further construction, refinement and evaluation of the WELLNESS thesaurus and user evaluation of the database-driven WELLNESS web site.

8.5.1 Development and implementation of database-driven web site

A model for the development of the database-driven web site was proposed in Chapter one, Figure 1.1. This model outlined three phases; design, development and implementation. The growth of the Internet and the Web has impacted health information-seeking behaviour and health information delivery systems. The Web has changed the way in which information can be made available. This has had significant implications for the design process. The decision to design a database-driven web site rather than a software-based database, as proposed in the original study (Steyn 1999) and set out in Annexure one, delimited this study to concentrate on the design phase. The design phase included the choice of a web-based database host and the design of a low-fidelity prototype web site.

It is recommended that phases two and three of the model, as shown in Figure 1.1, that of development and implementation, be the focus of a further study. In Figure 8.1 the rectangles represent what was undertaken in this study (web site conceptual model, web site prototype, database conceptual schema) and the ovals represent research for a subsequent study.
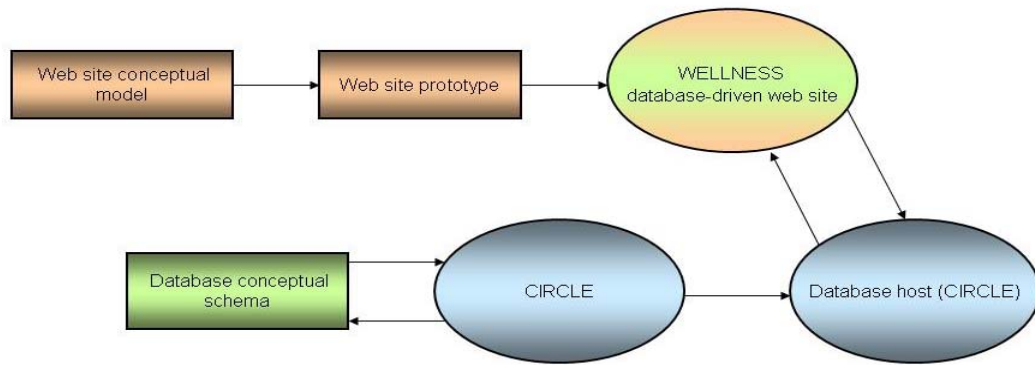
Figure 8.1 Development and implementation of WELLNESS database-driven web site

It is recommended that the development phase be undertaken to:

- map the conceptual schema assessed in Chapter six to the CIRCLE database
- communicate with CIRCLE Directors' of Operations and Technology and both parties make the necessary modifications to map the E-R diagram to the CIRCLE database structure
- develop the thesaurus structure within CIRCLE
- select WELLNESS resources to be included in database delimited by the WELLNESS approach and selected according to the content selection criteria within five-dimensional model
- input data about WELLNESS resources into database
- abstract and index WELLNESS resources
- test WELLNESS database
- hire web designer to use prototype WELLNESS web site to develop WELLNESS web site
- test web site usability, make changes where necessary based on user evaluation
- integrate WELLNESS database hosted by CIRCLE with WELLNESS web site
- test database-driven WELLNESS web site
- test search, browse and retrieval functions

- make necessary modifications ready for high-fidelity prototype development.

Upon completion of the development phase, it is recommended that the database-driven WELLNESS web site become fully functional. This requires that the WELLNESS database hosted by CIRCLE be linked to the WELLNESS web site in the development of a high-fidelity prototype WELLNESS web site. This high-fidelity prototype will be tested, evaluated and necessary modifications made for the database-driven WELLNESS web site to be made available on the Web and become fully-functional.

It is recommended that once the WELLNESS web site is fully-functional continuous evaluation be done to ensure its currency, relevancy, accuracy to meet WELLNESS health information seeker needs. This requires investment of people, time, money and maintenance of the web site to ensure currency and credibility. It is also recommended that WELLNESS resources be added on a regular basis to provide current, credible, quality and proven WELLNESS information by using the selection criteria model for inclusion or exclusion of resources.

8.5.2 Development and refinement of WELLNESS thesaurus

It is recommended that the WELLNESS thesaurus, constructed in Chapter five and presented in Annexure two, be further developed, continually evaluated in light of research and development in CHV and modified, maintained and evaluated to accurately reflect the subject vocabulary of WELLNESS. It is further recommended that the WELLNESS thesaurus serve as the structure for the development of thesauri and subject indexing for search and retrieval in CIRCLE. Continuous identification of relevant terms and evaluation of the thesaurus should take place to facilitate the WELLNESS health information seeker search, browse and retrieval activities.

8.5.3 User evaluation of database-driven WELLNESS web site

It is recommended that the WELLNESS health information seeker, identified and profiled in Chapter three, Table 3.9, use the heuristic instrument, selected and included as Annexure four, to evaluate the web site at various stages of development and implementation. This will ensure that the web site design is user-centred, meets the criteria of usability and provides access to the information needed to answer the WELLNESS health information seeker's questions.

8.6 PROPOSED AREAS FOR FURTHER RESEARCH

The following areas for future research are identified:

• Sources of funding

Research to find sources of funding to continue the development and implementation of the database-driven WELLNESS web site from a prototype to a fully-functional database-driven web site should be undertaken. Funding for the expansion, updating and maintenance of the web site should also be researched.   Potential sources of funding include the SDA General Conference, the SDA North American Division, grants, donations, individuals, advertisements, lifestyle centres and partnerships. Further research on the use of funds to collect WELLNESS resources and to make these available and accessible is required. A consortium-based funding structure in which lifestyle centres and WELLNESS practitioners collaborate should also be researched.

• Integration and provision of WELLNESS services

The possibility of the provision of services such as blogs, podcasts, RSS feeds and social networking tools such as an online WELLNESS community, forums and discussion boards should be investigated.

- WELLNESS content

The expansion of the database-driven WELLNESS web site from providing access to information about sources and resources of WELLNESS health information to inclusion of actual sources and resources requires further research. The infrastructure that the Internet provides for the provision of vast amounts of information on the Web and the existing and emerging technologies that facilitate the provision of and access to information should be researched.

This research project was delimited to the study of the user, resources and tool in the context of the design of the prototype database-driven WELLNESS web site. Figure 1.1 outlined the steps required to implement a fully-functional database-driven WELLNESS web site. The design phase was the focus of this study.   It is recommended that further development of the prototype database-driven WELLNESS web site to implementation as a fully-functional database-driven WELLNESS web site should be the goal of further study.

8.7 CONCLUSION

This study was a continuation of the original research (Steyn 1999). The user, the resources and the tool were researched to develop a reference database of health information resources to facilitate informed lifestyle choice. The literature was analysed to understand the user as health information seeker in the context of the emergence of a new health care worldview. A specific group of health information seeker was profiled as the WELLNESS health information seeker.   The search for wellness and optimal health characterises the WELLNESS health information seeker.   A specific framework of WELLNESS was identified to inform the choice of WELLNESS sources and resources. This required the development of content selection criteria within a five-dimensional model to provide relevant, reliable, quality and credible WELLNESS health information resources. The tool comprised three aspects, namely the construction of a WELLNESS thesaurus, assessment of the conceptual schema and choice of suitable database host

and the design of the prototype WELLNESS web site. The focus of this study was the design phase. Recommendation was made to further develop and implement a fully-functional WELLNESS database-driven web site.

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NISO *see* National Information Standards Organization

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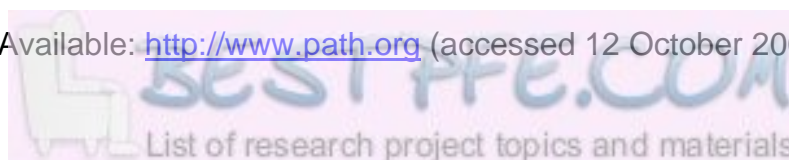
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ANNEXURE ONE

SUMMARY OF ORIGINAL STUDY (STEYN 1999)

The original research *the design of a database of resources for rational therapy (*Steyn 1999) provides a background for this study. A summary of the research, together with the most important findings and conclusions, will be provided to inform the current study:

- ABSTRACT OF ORIGINAL STUDY

The purpose of this study is to design a database of resources for rational therapy. An investigation of the current health situation and reorientation towards primary health care (PHC) in South Africa evidenced the need for a database of resources which would meet the demand for rational therapy information made on the Helderberg College Library by various user groups as well as make a contribution to the national health information infrastructure. Rational therapy is viewed as an approach within PHC that is rational, common-sense, wholistic and credible, focusing on the prevention and maintenance of health. A model of the steps in database design was developed. A user study identified users' requirements for design and the conceptual schema was developed. The entities, attributes, relationships and policies were presented and graphically summarised in an Entity-Relationship (E-R) diagram. The conceptual schema is the blueprint for further design and implementation of the database.

- INTENTION OF THE STUDY

An intention of this research project was to investigate the current situation in the health initiative in South Africa so that the role of rational therapy information in an information infrastructure could be established. This was the focus of Chapter two. Chapter three evidenced that the design of a database would be valuable in its potential contribution to the health information

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infrastructure in South Africa by organising resources which reflect a specific approach to primary health care (PHC) - that is rational therapy. The information provided in a database would support the initiatives of the Ministry of Health in South Africa with regards to health promotion (HP) and PHC as well as support training and research and assist health providers in their task. The level of health of a society reflects the choices made on an individual and community basis. Information is required to make these choices. In order for this database to be designed to be user-centred a user study was conducted to collect and analyse user requirements. This was the focus of Chapter four. The conceptual design was developed in Chapter five. In conclusion Chapter six made recommendations and proposed areas of further research.

- PROBLEM STATEMENT

Questions believed to be relevant and forming the basis for the study were:

- assuming that rational therapy has a role in PHC in South Africa, what should a database comprise in order to organise the existing body of knowledge relevant to a rational therapy approach within PHC?
- how can these resources best be made available so as to meet the users' information requirements in order to contribute to the reorientation towards PHC in South Africa?

Sub-problems identified were identified:

- what is the relevant body of knowledge concerned with PHC and more specifically the information which undergirds the rational therapy approach (ie what is the information infrastructure)?
- what are the information requirements of users and potential users?
- what should a database comprise to answer to the needs of the relevant body of knowledge and the potential users?
- how can a database contribute to the credibility of the rational therapy approach?

- RESEARCH METHODOLOGY

Methods used in the study included:

- an extensive literature survey
- the development of a model for database design
- a user study in which data was collected and analysed using a combination of qualitative and quantitative research methods to establish user requirements for the design of the conceptual schema
- design of the conceptual schema which consisted of the data dictionary, operations dictionary and the Entity-Relationship (E-R) diagram.

- SUMMARY OF FINDINGS

Answers to the questions raised in the problem statement and sub-problems are considered to be the findings of the study.

- Health crisis and need for information

The purpose of the study was to support the reorientation towards a PHC approach by the current National Health initiative with the design of a database that would make resources on the rational therapy approach available and accessible to individuals for informed decision making about their health and the prevention of disease.

A significant problem identified was the lack of clarity about the concept 'rational therapy' which is fraught with the potential of misunderstanding because of the bias towards the biomedical approach. Rational therapy has to do with knowledge of the physiology of the body and its relationship to health and healing and reflects the personal responsibility for health. It is a rational approach to living in such a way that disease is prevented rather than fostering a dependence on the curative approach. Knowledge

of the immune system and the maintenance of its well being are a personal responsibility and evidence a rational approach to life. Essentially it is holistic, preventative and recognises eight key components of a healthy lifestyle, namely the use of water both internally and externally; living a life of balance i.e. temperance or abstinence from substances such as tobacco, caffeine, and alcohol; exercise; fresh air; nutrition; sunshine; rest and relaxation; loving relationships with others; and stress management.

- User study

A model of the user (figure 4.1) in which research questions were identified formed the basis of the user study:
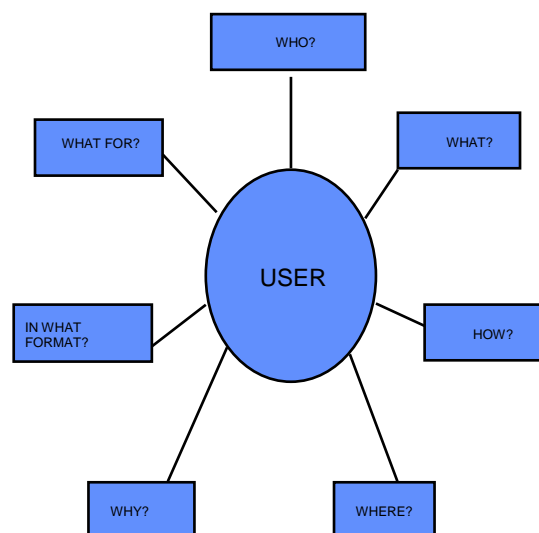
Figure 4.1 Model of the user

Who?

Who are the people to be served? (Soergel 1985:94). How important are their decisions or problem solutions? How valuable is their time? What are their characteristics, backgrounds and skills? What is the level of their language competence and ability to communicate? Do they do their own searches? Do they use the information or entities or do they pass it on to

others? Demographic and biographical information describing the user aid in answering this question, that is a profile. The tasks and roles that the user performs, with reference to information, should be identified. A 'good' system should be able to cope with various types of users, from the novice to sophisticated user (Tenopir & Lundeen 1989:81). The actual and potential users should be included in the study.

What?

What are their problems? What information or entities are needed to solve these problems? What is the scope of the information or entities needed? What searches are to be expected? (Fidel 1991:246). The question 'what?' includes what the user needs as well as what system will be used, for what purpose and which is the most suitable system. The relationship between the human and machine is vitally important, as the system should support the activities performed by the user (Mayhew 1992:73). The concepts of 'ease of use', 'user-friendliness', and usability play a role in this human-machine interaction. The user should express his version of the definition of these concepts.

How?

The way the user interacts with the system is done via the interface, which is the point of communication between the user and the system (Newman & Lamming 1995:44). Will the system function according to the users' requirements? These criteria should be detailed by the users and are considered as requirements.

Where?

The need for information has to do with where the information can be found. The interface plays an important role as its success can only be measured by the users who are able to easily, quickly and logically locate the information they seek (Crow 1992:184). This defines the efficiency

and effectiveness of the system. The environment in which this human-machine relationship exists should be conducive to satisfying needs according to the criteria of the user. Where can I find information to solve my problem, make decisions and do my tasks? 'Where' is also related to the availability and accessibility of information. It is the choice by the researcher as to the best medium.

Why?

Users seek systems that will allow them to do more, better and faster (Mayhew 1992:5). This need for information is what directs the tasks of users and their information-seeking behaviour. Humans are variable and so too are the tasks they should accomplish, the problems that they encounter as well as the information that they believe will satisfy their need and solve their problems.

In what format?

Users want information and information about entities in a convenient format. The information system should enable the user to achieve his/her goals. According to Shneiderman (1992:8), most users do not want to be encumbered by the computer. A well-designed interactive system responds to the action of the user and it is almost as if the interface disappears thus enabling the users to concentrate on their work and what they want to do with the system.

What for?

Users need to carry out their tasks safely, effectively, efficiently and enjoyably. They need relevant, specific, current, up-to-date information (Preece 1993:14). This information is perceived as the solution to the problem that is actually a question that needs an answer. This is their ultimate goal. Information-seeking is the behaviour of the user to solve

problems, make sound decisions and correct mistakes with the information acquired.

User requirements were collected using the questionnaire and structured interview method and the data analysis was undertaken using a combination of qualitative and quantitative research methods. The results were analysed and presented in Table 5.2. Resources will be included in the database based on a selection policy of stated criteria for inclusion and exclusion of resources that are credible and scientifically proven.

Table 5.2 User requirements and selection policy

USER REQUIREMENT	SELECTION POLICY
1. Credible information	Identify relevant resources. Continuously evaluate potential resources including bio-medical literature for information which reflects the rational therapy approach. Use a combination of academic (e.g. correct use of reference techniques, bibliographies, citations, abstracts) and scientific criteria (reference to empirical studies) to evaluate information, facts, statistics, case studies as well as the skills of the trained information scientist to establish credibility of resources. Use citation indexes to trace cited and original authors writing in the area of rational therapy, lifestyle medicine, natural remedies, etc.
2. Scientifically proven information	Use of scientific method including use of empirical method and acceptable method of presentation of information to disseminate information. Check credentials of authors. Acceptability in scientific circles.
3. Information needed for different groups a) lecturers, b) health professionals, c) students, d) librarians and e) laypersons	Select resources relevant to the requirements of the various user groups to ensure that all needs are met.
4. Information needed for different tasks and functions relative to user group	Select resources that reflect a variety of information so that the tasks and functions specific to each user group may be met. Resources should reflect a range from academically based information to consumer and self-help information.
5. Resources should be available and accessible	Avoid duplication of resources wherever possible but ensure that information about available resources is centralised in the database. Location of entities should be clearly indicated in the database for accessibility. Loan policies are dictated by the relevant holding organisations but the information about the entities should be available.
6. Current information on a broad wholistic view of HP including lifestyle, health problems and patterns of disease	Information selected should reflect the rational therapy approach and include a variety of current, relevant resources. To ensure a balanced collection, resources that question both the bio-medical and alternative approaches should be included. The database should be continuously updated to include the most recent research findings on rational therapy.
7. 'Anything' that supports the rational therapy approach	The information professional is expected to have expertise in the rational therapy approach and to continuously scan the literature for the inclusion of current research findings.
8. Include material recommended by user	The database will accommodate resources recommended by various user groups. Inclusion of such sources will be subject to criteria as stated in the selection policy and administered by the information professional.
9. PHC in the South African context	Resources should include a First and Third World approach to lifestyle, health and disease.

The user study identified terms believed to be relevant and significant as access points to rational therapy resources and this impacted on a selection policy as well as the construction of a subject thesaurus. Subject was the most important entity identified from user requirements. Associated with Subject are issues of indexing, vocabulary control and thesaurus construction.

- Thesaurus construction

What follows is a framework for the construction of a thesaurus as per main user groups surveyed. Together with these terms a literature survey could aid in the process of the compilation of a thesaurus as well as tools such as glossaries, indexes and the Library of Congress Subject Headings (LCSH). This would facilitate the selection of terms to be used in the database for subject searching and describing entities.

LECTURERS

Air
Balance
Cancer
Candida albicans
Colourants, preservatives
Depression
Diabetes
Diet
Exercise
Facilitation
Food/nutrition
Health
Herbs
Hydrotherapy
Hypoglycaemia
Immune system
Lifeskill techniques
Lifestyle disease
Lifestyle disease causes
Lifestyle disease management
Marriage
Micronutrients and health
Natural remedies
NEWSTART
Organic agriculture
PHC
Physical therapies
Regularity
Rest

Toxins
Water
Wellbeing

STUDENTS

Air
Alternative approach
Anatomy and physiology
Back alignment
Balance
Birth control
Blood pressure
Candida albicans
Charcoal
Child guidance
Community health
Cooking schools
Diabetes
Diet
Disease prevention
Disease reversal
Environment and health
Exercise
Family
First aid
Habits
Health promotion
Herbs
Home nursing
Household remedies

Hydrotherapy
Immune system
Introduction to human behaviour
Lifestyle
Malnutrition
Marriage
Mind-set health
Minerals
Natural medicine
Natural remedies
NEWSTART
Nutrition
Obesity
Obstetrics
Organic gardening
PHC
Physical fitness
Prevention
Prevention degenerative diseases
Psycho-socio-environmental medicine
Psychological counseling for sickness
Regularity
Relationships
Religious topics
Rest
Stress
Sunlight
Temperance
Third world
Trace elements
Trust in God
Tuberculosis
Vegan food
Vegetarianism
Vitamins
Water
Wholistic health
Work opportunities

LAYPERSON

Alcohol - effects
Allergies
Botany
Diet
Disease prevention
Drugs - effects
Exercise
Health promotion
Herbs
Hydrotherapy
Hygiene
Medication
Natural remedies
Nutrition
Physiology
Physiotherapy
Psychology
Recipes
Tobacco - effects

Treatment
Vitamin supplements
Wholistic health

HEALTH PROFESSIONAL

Air
Back problems
Behaviour changes, motivation
Bio-medical
Bowel disease
Cancer
Colourants and preservatives
Decision-making
Exercise
Experts
Facilitation
Herbs
Home care giving
Hydrotherapy
Lifeskill techniques
Lifestyle choices
Lifestyle disease
Lifestyle disease management
techniques
Massage
Medical science trends
Microbusiness management
Mind-set health
Natural alternatives to drug medication
Natural remedies
NEWSTART
Nutrition & diet
Physiotherapy
Poultices
Prevention
Problem-based learning
Psycho-socio-environmental health
Psycho-somatic illness
Rest
Sociological
Stress
Sunshine
Temperance
Trust in God
Water
Wellness

LIBRARIANS

Disease
Drug abuse
Exercise
Health education
Herbs
Medication
Minerals
Nutrition
Physiotherapy
Vitamins

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In the literature study, it was noted that there is a growing body of knowledge that supports the rational therapy approach, but that there was no organised collection of this body of knowledge, nor a mechanism for organising it. It was necessary to define and delineate the scope of the rational therapy approach and then design a database which would make resources for rational therapy available and position it within the information infrastructure.

- Database and its design

The research project reinforced the positioning of the database not only for user groups at Helderberg College but in the larger information infrastructure in South Africa. It was shown that a database of resources for rational therapy would centralise this collection of information and information about entities and hereby make these resources available and accessible.

A model for the database design (figure 3.3) was established to include only those steps relevant and necessary for the design of the database. This model was then followed step by step to establish the boundaries of the research study, to collect the user requirements and analyse these to inform the design of the conceptual schema.

Table 5.1 summarises the user requirements identified during the user study for the design of the database.
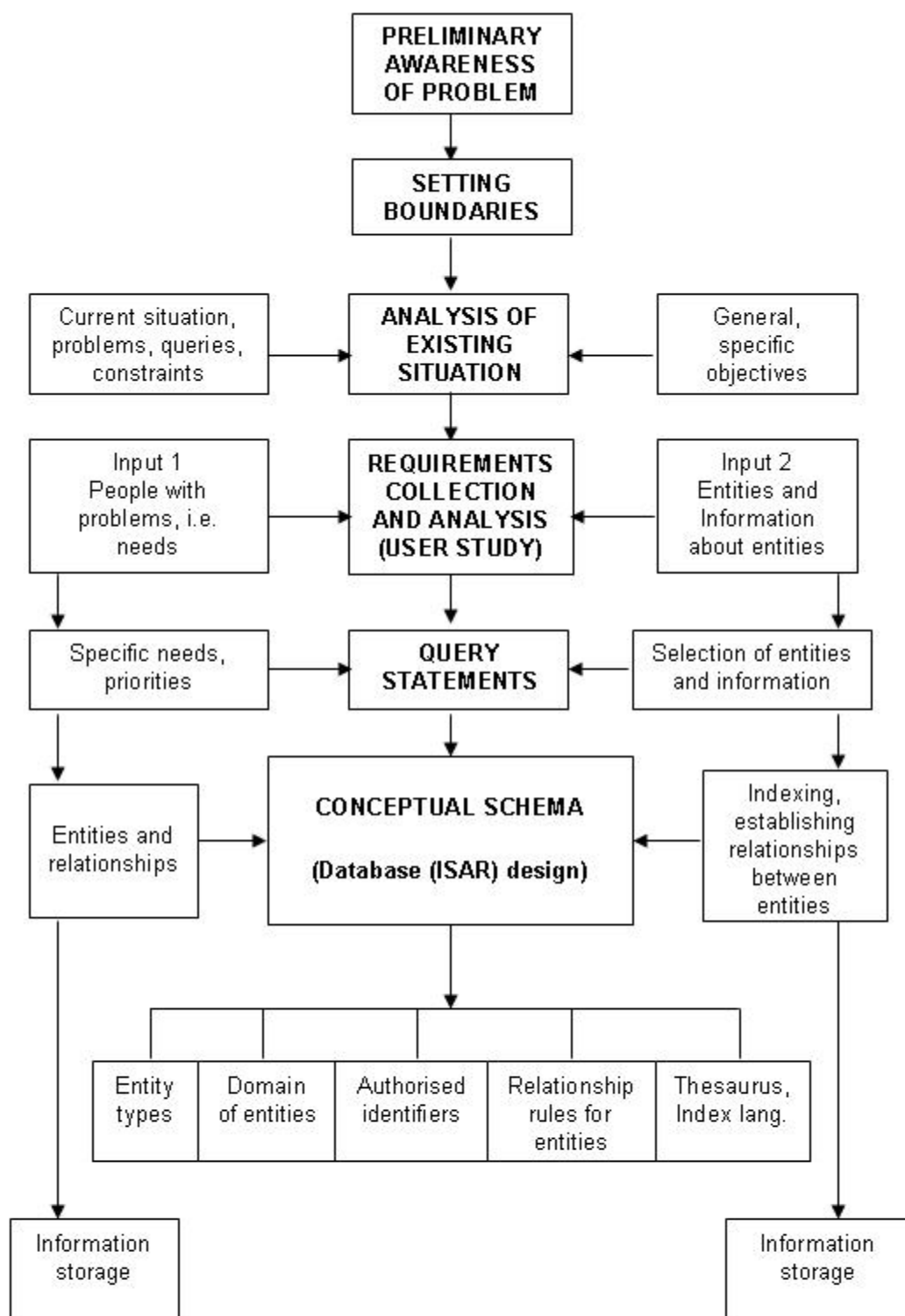
Figure 3.3 Model of database design

Table 5.1 Summary of user requirements for database

USER REQUIREMENTS FOR DATABASE	
INPUT	User-friendly system, ease of use, menu-driven, provide help, guide the user through processes, a choice of access points for input and facilitate output. Cater both for intermediary and end-user searching.
OUTPUT	Input should facilitate output, ie retrieval of information to satisfy requirements. Print out, save to disk, on-screen options for viewing information. Information or information about entities on a subject specified by the user. Information or information about entities by a particular author. Information or information about entities by a particular author on a particular subject. Information on an individual or organisation specialising in a specific subject area. Information on a particular subject in a particular format (media type). Information on the location of a particular entity.
ENTITIES	User. Location. Directory. Media type which includes videotapes, periodical articles, books, pamphlets, periodicals, audiotapes, CD-ROM, posters, contact people, experts, Internet URLs, newspaper clippings, subject files, research papers, databases and visiting speakers. Author. Subject.
ACCESS POINTS	Subject, author, media type, combinations.
DATABASE	Provide answers to questions and enable the fulfilment of tasks and functions of the various user groups. Allow each user access to the information contained in the database. Centralise information about entities, even if entities are not centrally located.
RESOURCES	Selection policy with regard to resources is discussed in Table 5.2. The location of each resource should be indicated for accessibility. Wide variety of resources used to satisfy information requirements.

From the findings of the user study user requirements were used to develop the conceptual schema which consisted of the establishment of a data dictionary, an operations dictionary and an E-R diagram. These three components of the conceptual schema constitute the blueprint for the database.

The entities, their attributes and the policies that were determined were represented in tabular form and form an integral part of the conceptual schema Tables for User, Location, Subject, Related, Broad, narrow, Unauthorised, Mediatype, Book, Print, Graphic, Computer, URL, Audiovisual, Directory, Author, Publisher and Source were outlined.

Table 5.3 Entity – User

USER ENTITY		
(A person, whether it be an individual or an organisation, who has used the database at least once)		
ATTRIBUTE	DESCRIPTION	POLICY
UserID	Authorised identifier	S (Student), L (Lecturer), HP (Health Professional), LIB (Librarian), LAY (Layperson), O (potential user group) followed by a numerical number.
UserSname	Surname of the user	Follow AACR2 rules.
UserFname	First name of the user	Follow AACR2 rules.
UserAddr	Postal address of the user	Use postal address for posting materials.
UserTel	Telephone number of the user	Preface with national or international dialing code.
UserFax	Fax number of the user	Preface with national or international dialing code.
UserEmail	E-mail address of the user	Use e-mail address as specified by user in case of more than one e-mail address.
UserOcc	Occupation of the user	Short description of user occupation, eg doctor.
UserPassw	Password supplied by the database administrator	Supply user password for access as determined by database administrator.

Table 5.4 Entity – Location

| LOCATION ENTITY |||
| (The physical whereabouts of an entity (its location)) |||
ATTRIBUTE	DESCRIPTION	POLICY
LocID	Authorised identifier	Each location will have a unique location ID, numbered sequentially. Not null.
LocName	Named location eg HP department	Each location will have a unique, standardised name by which it will be known and included in the database.
LocAddr	Street address of location	Each location will be entered by street address for physical access to the resource collection housed there.
LocTel	Telephone number of location	Telephone number will be that of the location itself or the contact person.
LocFax	Fax number of location	Fax number will be that of the location itself or the contact person.
LocEmail	E-mail address of location	E-mail address will be that of the location itself or that of the contact person.
LocContact	Contact person for location	The person responsible for the resource collection uniquely identified in the database.

Table 5.5 Entity – Subject

| SUBJECT ENTITY |||
| (Describes the descriptors which are included in the subject thesaurus) |||
ATTRIBUTE	DESCRIPTION	POLICY
SubjID	Authorised identifier	Enter a unique number to indicate each subject descriptor included in the subject thesaurus. Not null.
SubjDesc	Subject descriptor	Enter subject descriptor as determined for inclusion in thesaurus. Not null.
SubjUse	Preferred subject descriptor	Indicate when preferred descriptor should be used instead of subject descriptor listed in SubjDesc.
SubjNote	Note about subject	Enter notes about subject as applicable.

Table 5.6 Entity – Related

RELATED ENTITY		
(Indicates descriptor related to subject descriptor entered in Subject entity)		
ATTRIBUTE	**DESCRIPTION**	**POLICY**
RelID	Authorised identifier	Enter a unique number for a related descriptor. Not null.
RelDesc	Related descriptor	Enter related descriptor to a subject descriptor specified in the Subject entity and determined in establishment of subject thesaurus.
SubjID	Subject identifier	Enter SubjID for subject descriptor related descriptor is related to.

Table 5.7 Entity – Broad

BROAD ENTITY		
(Lists broader subject descriptors for subject descriptors as specified in the subject thesaurus)		
ATTRIBUTE	**DESCRIPTION**	**POLICY**
BroID	Authorised identifier	Enter a unique number for the broader descriptor. Not null.
BroDesc	Broader descriptor	Enter broader descriptor for a subject descriptor as specified in the establishment of the subject thesaurus.
SubjID	Subject identifier	Enter SubjID for narrower subject descriptor broader descriptor describes.

Table 5.8 Entity - Narrow

NARROW ENTITY		
(Lists the narrower descriptor for a subject descriptor as specified in the establishment of the subject thesaurus)		
ATTRIBUTE	**DESCRIPTION**	**POLICY**
NarID	Authorised identifier	Enter a unique number to identify narrower descriptor.
NarDesc	Narrower descriptor	Enter narrower subject descriptor for a subject descriptor as specified in the establishment of the subject thesaurus.
SubjID	Subject identifier	Enter SubjID of broader descriptor narrower descriptor is related to.

Table 5.9 Entity – Unauthorised

UNAUTHORISED ENTITY (Consists of those subjects that are not authorised subjects)		
ATTRIBUTE	**DESCRIPTION**	**POLICY**
UnauthID	Authorised identifier	Enter a unique number to indicate each unauthorised descriptor. Not null.
UnauthDesc	Unauthorised descriptor	Enter unauthorised descriptor.
SubjID	Subject identifier	Enter SubjID for subject descriptor used instead of unauthorised descriptor.

Table 5.10 Entity – Mediatype

MEDIATYPE ENTITY (Supertype entity consisting of subtype entities containing common attributes to all subtypes)		
ATTRIBUTE	**DESCRIPTION**	**POLICY**
AccNo	Authorised identifier	Use unique accession number as determined in individual subtype mediatypes, eg. B1 for BOOK entity. Not null.
AuthID	Author identifier	Choose appropriate author identifier indicating author of entity from Author entity.
Title	Title of mediatype	Follow AACR2 rules. Not null.
Date	Date of publication	Follow AACR2 rules.
PubID	Publisher identifier	Include publisher details from publisher authority list, ie List PubID for specific publisher.
Note	Notes area	Follow AACR2 rules.
LocID	Location identifier	Use location identifier as uniquely determined in LOCATION entity.

Table 5.11 Entity – Book

BOOK ENTITY		
(Describes monographs)		
ATTRIBUTE	**DESCRIPTION**	**POLICY**
AccNo	Authorised identifier	Enter a unique accession number prefixed by the symbol B followed by a numeral.
BookEd	Edition statement	Follow AACR2 rules for edition statement.
BookSer	Series statement	Follow AACR2 rules for series.
BookPhy	Physical description	Follow AACR2 rules for physical description.
BookISBN	10 digit International Standard Book Number	Enter ISBN if available as 10 digits. If only 9 digits, add X to end of number.
BookCallno	Classification number	Enter allocated call number if known.

Table 5.12 Entity – Print

PRINT ENTITY		
(Indexed articles from periodicals, newspapers and other materials)		
ATTRIBUTE	**DESCRIPTION**	**POLICY**
AccNo	Authorised identifier	Enter a unique accession number prefixed by the symbol P followed by a numeral. Not null.
PrintVol	Volume of the print material	Transcribe volume number as appears in source entity.
PrintNo	Issue number of the print material	Transcribe number of issue as appears in source entity.
PrintMo	Month/season of the print material	Transcribe month or season as appears in source entity when available or to indicate individual issue.
PrintPg	Page numbers the article appears on	Indicate the page numbers the article appears on in the source entity.
SourceID	Source identifier	Use the SourceID from the Source entity for a standardised source title.

Table 5.13 Entity – Graphic

GRAPHIC ENTITY		
(Describes graphic materials of all kinds, eg charts, photographs, filmstrips, slides)		
ATTRIBUTE	**DESCRIPTION**	**POLICY**
AccNo	Authorised identifier	Enter a unique accession number prefixed by the symbol G followed by a numeral, eg G1. Not null.
GraphEd	Edition statement of the graphic entity	Follow AACR2 rules.
GraphPhy	Physical description of the graphic entity	Follow AACR2 rules.
GraphSer	Series graphic entity belongs to	Follow AACR2 rules.

Table 5.14 Entity – Computer

COMPUTER ENTITY		
(Describes encoded files for manipulation by computer, including CD-ROM (AACR2))		
ATTRIBUTE	**DESCRIPTION**	**POLICY**
AccNo	Authorised identifier	Enter a unique accession number by symbol C followed by a numeral, eg C1. Not null.
ComEd	Edition of the computer file	Follow AACR2 rules.
ComChar	Characteristics of the computer file	Follow AACR2 rules.
ComPhy	Physical description details	Follow AACR2 rules.
ComSer	Series description	Follow AACR2 rules.

Table 5.15 Entity – URL

URL ENTITY		
(Describes uniform resource location (URL) for Internet web pages)		
ATTRIBUTE	**DESCRIPTION**	**POLICY**
AccNo	Authorised identifier	Enter a unique accession number by symbol U followed by a numeral, eg U1. Not null.
URLAddr	Internet address of web page	Transcribe URL exactly in http://www. format.

Table 5.16 Entity – Audiovisual

| AUDIOVISUAL ENTITY |||
| (Describes both audio material such as audiocassette tapes and audiovisual materials such as video cassette recordings) |||
ATTRIBUTE	DESCRIPTION	POLICY
AccNo	Authorised identifier	Enter a unique accession number prefixed by symbols AUD followed by a numeral, eg AUD1 plus an A or a B indicating side A or side B if necessary, eg. AUD1B (indicating side B of an audiocassette where the speaker is different to side A).
AudTime	Running time/Length	Include the running time or length of the audio or video recording.
AudSer	Series material belongs to	Follow AACR2 rules.
AudPhy	Physical description of the material	Follow AACR2 rules.

Table 5.17 Entity – Directory

DIRECTORY ENTITY		
(Refers to those individuals or organisations who specialise in, or have knowledge of a particular subject area)		
ATTRIBUTE	**DESCRIPTION**	**POLICY**
DirID	Authorised identifier	Enter a unique accession number prefixed by symbol R followed by a numeral, eg R1. Not null.
DirOrg	Organisation	Enter the name of the organisation used for referral purposes. If an individual within an organisation is used in networking include the name of the employing organisation.
DirPerson	Contact person	Enter the name of the contact person who has expertise in a particular field. Enter surname first, followed by a comma and firstname, eg Thrash, Agatha.
DirPos	Position held, eg Managing Director	Enter the title that the individual holds within the organisation or title earned through qualifications, eg Nurse.
DirAddr	Address of person or organisation	List the postal address for the individual or organisation.
DirTel	Telephone number	List the telephone number for the organisation or individual within the organisation.
DirFax	Fax number	List the fax number of the organisation or individual within an organisation if they have their own fax number.
DirEmail	E-mail address or organisation or individual	List the e-mail address of the organisation or an individual within an organisation.
DirWeb	Web page of individual or organisation	List the web page address of the organisation. In the case of an individual within an organisation having their own web page list their address if they are the contact person.
DirNote	Notes area	Include any notes which provide more information.
SubjID	Authorised identifier for Subject entity	List the main subject the individual or organisation specialises in.

Table 5.18 Entity – Author

AUTHOR ENTITY		
(Any person, whether it be an individual or a corporate body, who is intellectually responsible for the content of a work)		
ATTRIBUTE	DESCRIPTION	POLICY
AuthID	Authorised identifier	Each author to have a unique identifier - numerical. Not null.
AuthSname	Author surname	Follow AACR2 rules.
AuthFname	Author firstname	Follow AACR2 rules.
AuthIni	Author middle and other initials	Follow AACR2 rules.
AuthAddr	Author postal address	Enter author postal address if available or if it can be established for contact purposes.
AuthTel	Author telephone number	Enter author telephone number if available or if it can be established for contact purposes. Can be null.
AuthFax	Author fax number	Enter author fax number if available or if it can be established for contact purposes. Can be null.
AuthEmail	Author e-mail address	Enter author e-mail address if available or if it can be established for contact purposes. Can be null.
AuthWeb	Author web page	Enter authorised author web page if available. Do not enter unauthorised sites which merely mention or refer to the author. Can be null.

Table 5.19 Entity – Publisher

PUBLISHER ENTITY		
(That individual or organisation responsible for the publication of any entity)		
ATTRIBUTE	DESCRIPTION	POLICY
PubID	Authorised identifier	Each publisher to have its own unique identifier - numerical number. Not null.
PubPlace	Place where entity published	Follow AACR2 rules.
PubName	Name of publisher or distributor	Follow AACR2 rules.
PubAddr	Address of publisher or distributor	Follow AACR2 rules, enter if available.
PubTel	Telephone number of publisher	Enter if available.
PubFax	Fax number of publisher	Enter if available.
PubEmail	E-mail address of publisher	Enter if available.

Table 5.20 Entity – Source

SOURCE ENTITY		
(Describes source material such as periodicals and newspapers which are related to indexed articles)		
ATTRIBUTE	**DESCRIPTION**	**POLICY**
SourceID	Authorised identifier	Each source title to have a unique identifier – numerical number. Not null.
SourceTitle	Recognised title of the source	Follow AACR2 rules.
SourceFreq	Frequency of the source entity	Follow AACR2 rules.
SourceISSN	ISSN of the source entity	Enter ISSN if available.
SourceAddr	Address of the individual, organisation or publisher responsible for the periodical	Enter this information if available to aid in research and content verification.
SourceNote	Any other relevant information associated with the source entity	Enter title changes, any other information which could aid in the retrieval of the title.
SourceWeb	Web address of source entity	Enter the web address of source. Enter web details when a title is available electronically, free or on a subscription basis. Does not necessarily mean that it will be available but indicates its location.
PubID	Publication details	Enter publication details as listed in the publisher authority list indicated by PubID.

Table 5.21 Entity – Wrote

WROTE ENTITY		
(Composite entity of AUTHOR and MEDIATYPE)		
ATTRIBUTE	**DESCRIPTION**	**POLICY**
AuthorID	Authorised identifier from AUTHOR entity	Not null.
AccNo	Authorised identifier from MEDIATYPE entity	Not null.

Table 5.22 Entity – Stored

STORED ENTITY		
(Composite entity of SUBJECT and LOCATION entities)		
ATTRIBUTE	**DESCRIPTION**	**POLICY**
SubjID	Authorised identifier from SUBJECT entity	Not null.
LocID	Authorised identifier from LOCATION entity	Not null.

Table 5.23 Entity – Discuss

DISCUSS ENTITY		
(Composite entity for AUTHOR and SUBJECT entities)		
ATTRIBUTE	**DESCRIPTION**	**POLICY**
AuthorID	Authorised identifier for AUTHOR entity	Not null.
SubjID	Authorised identifier for SUBJECT entity	Not null.

Table 5.24 Entity – Describes

DESCRIBES ENTITY		
(Composite entity of SUBJECT and MEDIATYPE)		
ATTRIBUTE	**DESCRIPTION**	**POLICY**
SubjID	Authorised identifier for SUBJECT entity	Not null.
AccNo	Authorised identifier for MEDIATYPE entity	Not null.

Table 5.25 Entity – Prefers

PREFERS ENTITY		
(Composite entity of USER and SUBJECT entities)		
ATTRIBUTE	**DESCRIPTION**	**POLICY**
UserID	Authorised identifier for USER entity	Not null.
SubjID	Authorised identifier for SUBJECT entity	Not null.

Table 5.26 Entity – Housed

HOUSED ENTITY (Composite entity of AUTHOR and LOCATION entities)		
ATTRIBUTE	DESCRIPTION	POLICY
AuthorID	Authorised identifier for AUTHOR entity	Not null.
LocID	Authorised identifier for LOCATION entity	Not null.

Entities, relationships and composite entities are represented as follows:

= entities = relationships = composite entities
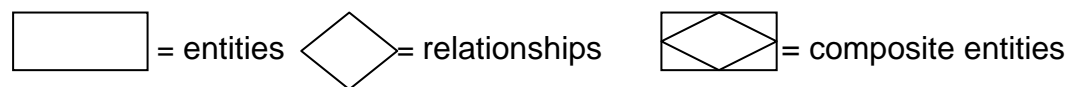
The researcher used a straight line to show relationships between entities (1:M, 1:1, M:1, M:N) as this was the convention in 1999. The crow's feet notation was not standard convention at the time.

SOURCE	1 — contains — 1,M	PRINT
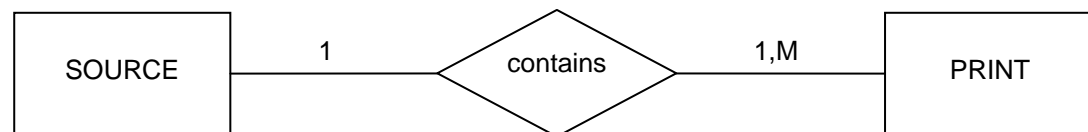
Figure 5.1 Relationship between Source and Print

PUBLISHER	1 — publishes — 1,M	MEDIATYPE

Figure 5.2 Relationship between Publisher and Mediatype

PUBLISHER	1 — publishes — 1,M	SOURCE
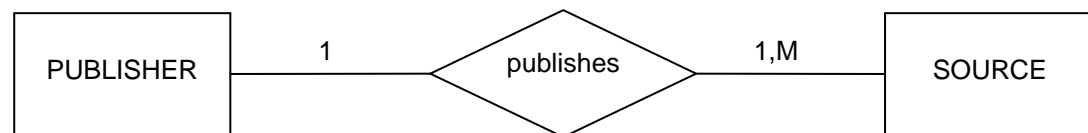
Figure 5.3 Relationship between Publisher and Source

DIRECTORY	1 — refers — 1,M	SUBJECT
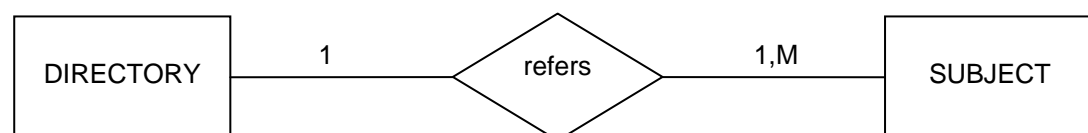
Figure 5.4 Relationship between Directory and Subject
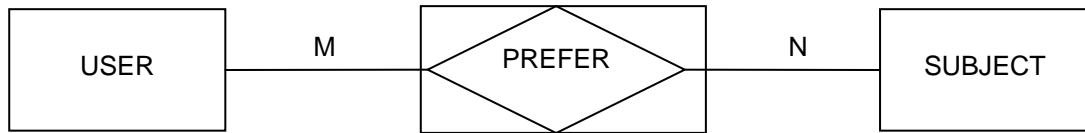
Figure 5.5 Relationship between User and Subject
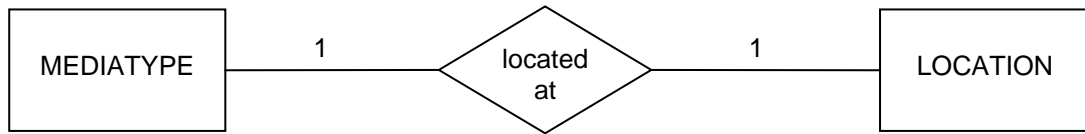
Figure 5.6 Relationship between Mediatype and Location
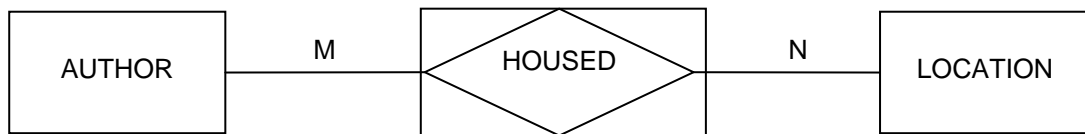
Figure 5.7 Relationship between Author and Location
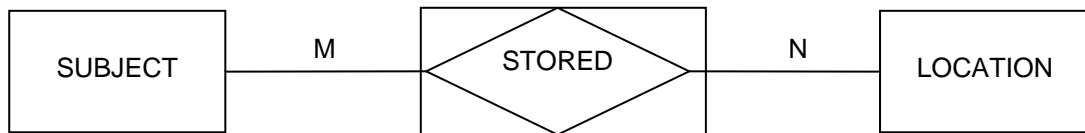
Figure 5.8 Relationship between Subject and Location
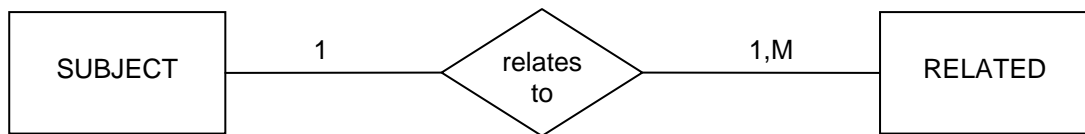
Figure 5.9 Relationship between Subject and Related
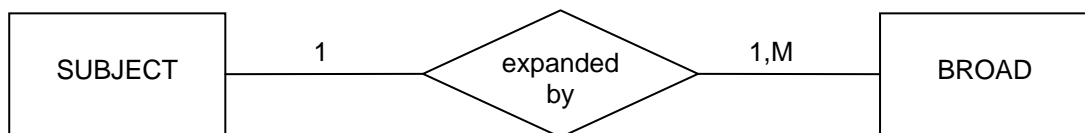
Figure 5.10 Relationship between Subject and Broad
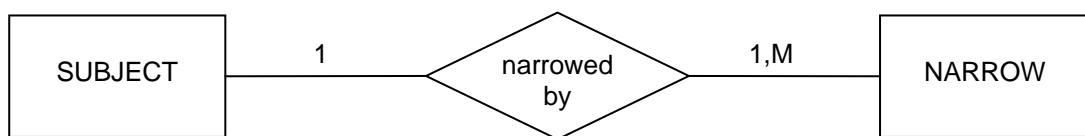
Figure 5.11 Relationship between Subject and Narrow
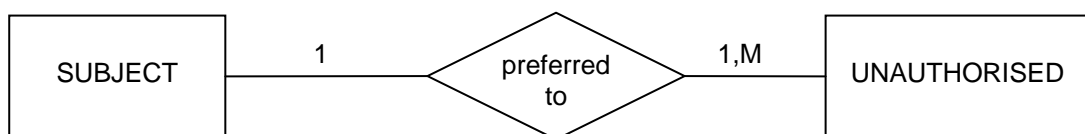
Figure 5.12 Relationship between Subject and Unauthorised

391
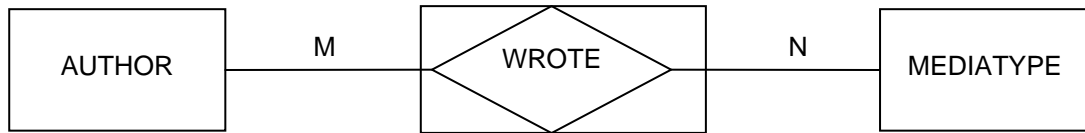
Figure 5.13 Relationship between Author and Mediatype
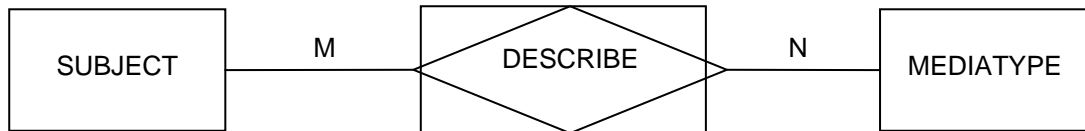
Figure 5.14 Relationship between Subject and Mediatype
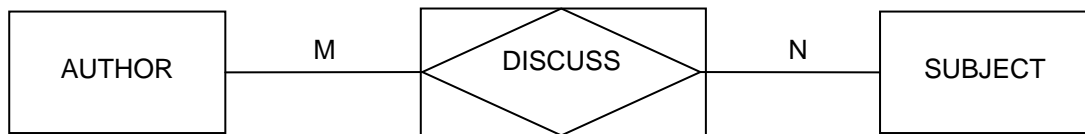
Figure 5.15 Relationship between Author and Subject
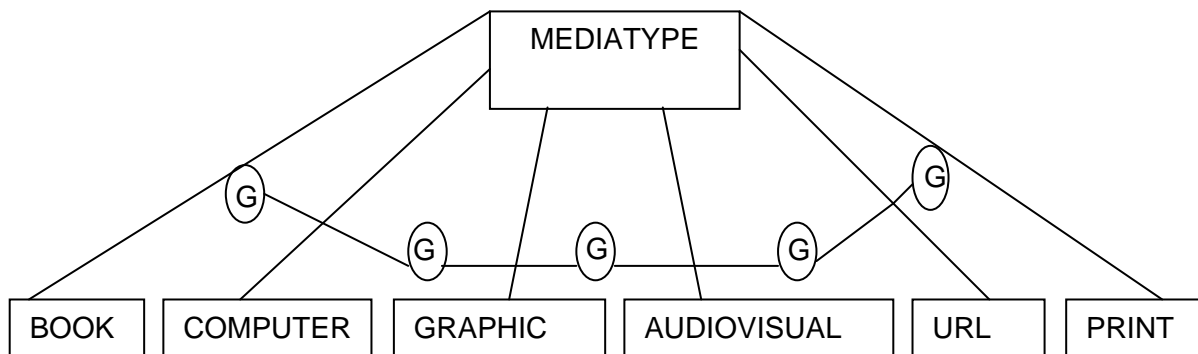
Figure 5.16 Mediatype generalisation hierarchy

The relationships were then integrated to form the E-R diagram (figure 5.17) which is a graphic representation of the conceptual schema.
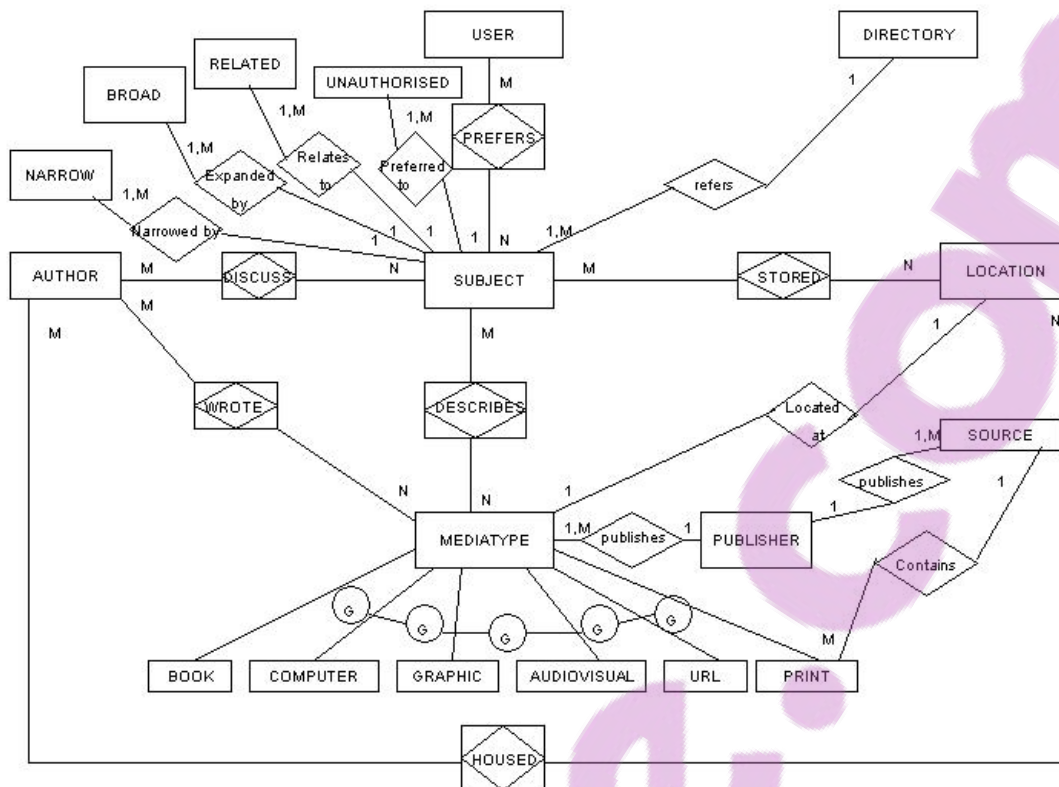
Figure 5.17 E-R diagram for rational therapy database

- RECOMMENDATIONS FOR FURTHER STUDY AND PROPOSED AREAS FOR FURTHER RESEARCH

Of the recommendations and proposed areas for further research made in the original study the following are relevant to the current study:

- Extended model of database design

It was recommended that the extended model Figure 6.1 be the focus of a further study so that the design process could be continued. This would follow on from the conceptual schema upon which the database can be implemented. It was recommended that a thorough investigation of suitable software should be undertaken and the choice be made after an evaluation of the advantages and disadvantages of available software. This would include whether the software will support a relational database and provide a user interface which will meet user requirements.

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According to the extended model the internal level of design refers to the mapping of the conceptual schema onto the medium using for storing data, the format in which the data are stored, methods used to provide access to the data, indexes, the amount of information provided with each entry, form of entries and internal organisation of entries.

The external level of design is concerned with issues such as a means to express a request, to ask questions in a language understood by the computer (interface language), a picture of the arrangement of the data and possible manipulation of data and formats for display of answers. Decisions made on the internal and external levels are software dependent.
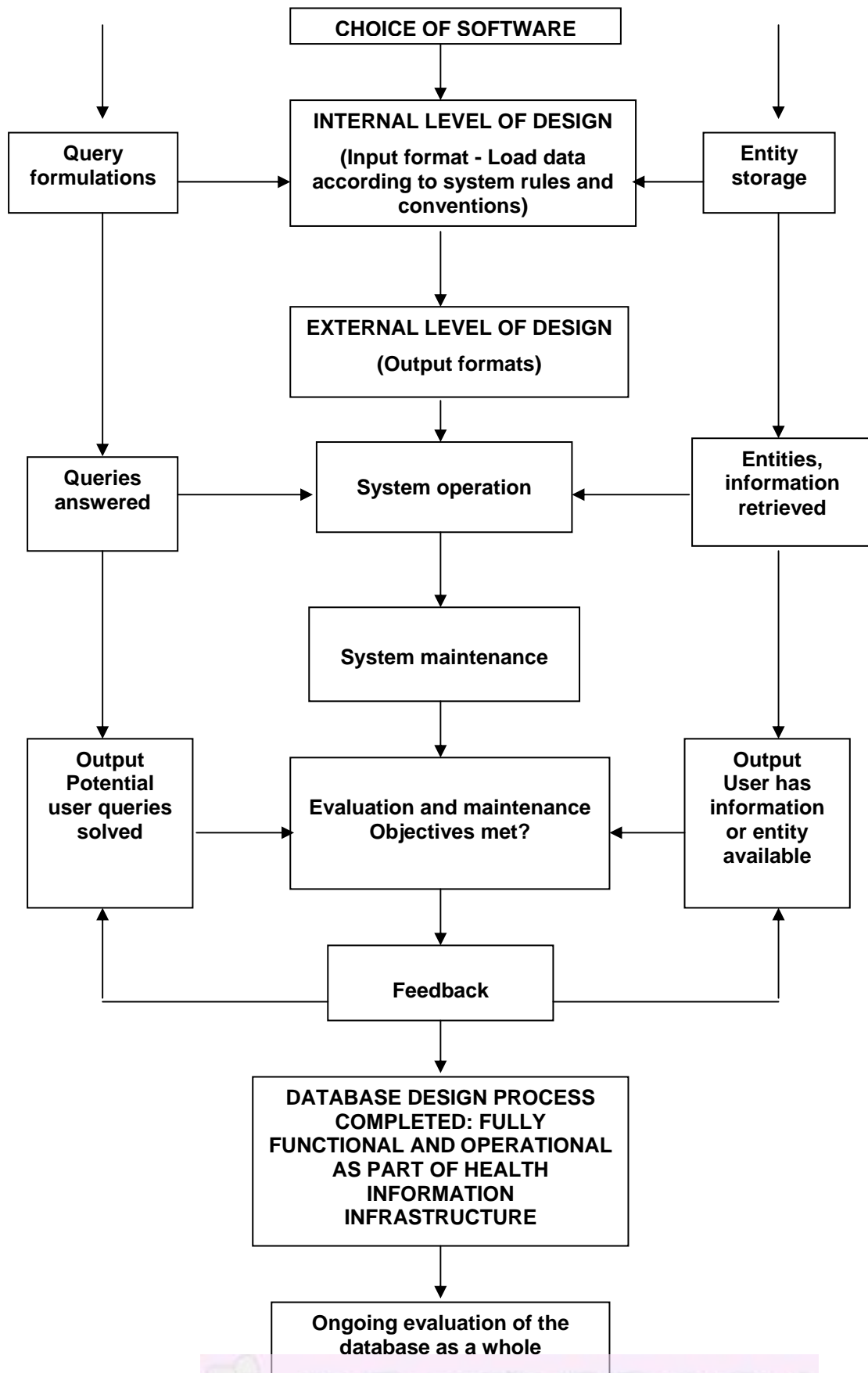
Figure 6.1 Extended model for implementation of database

It was recommended that user requirements collected and analysed be used to determine the input and output formats required for query formulation and answer to queries so that Output 1 results in potential user queries that are solved. The information storage and retrieval (ISAR) system has two inputs. Input 1 is query statements in which descriptions of the information or needed entities are formulated. Input 2 refers to the entities or information about entities as acquired. Once these two inputs have been brought to the system they should be matched and it is the task of the ISAR system to match these two inputs. The output of the ISAR system consists of entities or information about entities and their relationships. These outputs or responses to queries and factual answers to queries hopefully will solve, or assist in solving the problem that gave rise to the query. Once the input and output formats have been determined and refined the system becomes operational. The relevant resources should be selected according to the selection policy established. Once these have been selected the information and information about these entities should be input and stored. The database should then be maintained and evaluated to establish whether the objectives are being met. This is done through the process of feedback to determine whether the potential user queries are solved by means of retrieved information or entities made available. Output identifies whether Input 1 and 2 is being achieved and that the potential user queries are solved.

- Availability on the Internet

A user requirement derived from the user survey was for the database to be made available on a wider scale on the Internet. This aspect of use and availability was a proposed area for future research.

- Thesaurus compilation

It was recommended that the guidelines established for subject vocabulary control be used in the compilation of a thesaurus for rational therapy. This

would detail the subject descriptors to be used in the description of entities in the database. The subject thesaurus would be further developed and modified as the input and outputs in record format were tested.

- User evaluation of database

It was recommended that the user groups be consulted for the purpose of evaluation of the implemented database as it is imperative that the user is able to find information relevant to rational therapy to answer his/her queries.

This study was limited to the conceptual design of a database. This is however not the completed design process as in order for the database to operate effectively and efficiently according to user requirements the steps detailed in the extended model should be implemented and continuous evaluation done. It was recommended that this be the goal and focus of a doctoral study.

ANNEXURE TWO

WELLNESS THESAURUS
ALPHABETIC DISPLAY

ABSTINENCE
BT   Life in balance
RT   Addiction
      Adjustment (HE)
      Alcohol use
      Attitude change (HE)
      Cardiovascular risk factors
      (HE)
      Coping (HE)
      Depression (HE)
      Drug use
      Empowerment (HE)
      Health behaviour
      Human sexuality
      Independent living (HE)
      Laughter (MeSH)
      Laughter therapy (MeSH)
      Mental illness (HE)
      Psychological factors (HE)
      Psychosocial factors (HE)
      Self efficacy (HE)
      Sex behaviour
      Temperance (MeSH)
      Tobacco use
      Wit and humor (MeSH)

ADDICTION
BT   Life in balance
RT   Abstinence
      Adjustment (HE)
      Alcohol use
      Attitude change (HE)
      Cardiovascular risk factors
      (HE)
      Coping (HE)
      Depression (HE)
      Drug use
      Empowerment (HE)
      Health behaviour
      Human sexuality
      Independent living (HE)
      Laughter (MeSH)
      Laughter therapy (MeSH)
      Mental illness (HE)
      Psychological factors (HE)
      Psychosocial factors (HE)
      Self efficacy (HE)
      Sex behaviour
      Temperance (MeSH)

Tobacco use
Wit and humor (MeSH)

ADJUSTMENT (HE)
BT   Life in balance
      Lifestyle
RT   Abstinence
      Addiction (?)
      Alcohol use
      Attitude change (HE)
      Attitudes
      Cardiovascular risk factors
      (HE)
      Coping (HE)
      Decision-making
      Depression (HE)
      Drug use
      Empowerment (HE)
      Health behaviour
      Human sexuality
      Independent living (HE)
      Laughter (MeSH)
      Laughter therapy (MeSH)
      Mental illness (HE)
      Psychological factors (HE)
      Psychosocial factors (HE)
      Quality of life
      Risk factor intervention
      Self efficacy (HE)
      Sex behaviour
      Temperance (MeSH)
      Tobacco use
      Wit and humor (MeSH)

AEROBIC EXERCISE (HE)
BT   Exercise
RT   Body mass index (HE)
      Body size (HE)
      Diet (HE)
      Eating disorders (HE)
      Exercise movement techniques
      (MeSH)
      Exercise test (MeSH)
      Exercise testing (HE)
      Exercise therapy (MeSH)
      Exercise tolerance (MeSH)
      Health behaviour (HE)
      Muscle fatigue (MeSH)
      Obesity (HE)

Physical activity (HE)
Physical fitness (HE)
Risk factor intervention (HE)
Weight control (HE)

AIR (MESH)
BT   Fresh Air
RT   Air (MeSH)
       Air ionisation (MeSH)
       Air pollutants (MeSH)
       Breathing exercises (MeSH)
       Respiration (MeSH)

AIR IONISATION (MESH)
BT   Fresh Air
RT   Air (MeSH)
       Air pollutants (MeSH)
       Breathing exercises (MeSH)
       Respiration (MeSH)

AIR POLLUTANTS (MESH)
BT   Fresh Air
RT   Air (MeSH)
       Air ionisation (MeSH)
       Breathing exercises (MeSH)
       Respiration (MeSH)

ALCOHOL USE
BT   Life in balance
RT   Abstinence
       Addiction (?)
       Adjustment (HE)
       Attitude change (HE)
       Cardiovascular risk factors (HE)
       Coping (HE)
       Depression (HE)
       Drug use
       Empowerment (HE)
       Health behaviour
       Human sexuality
       Independent living (HE)
       Laughter (MeSH)
       Laughter therapy (MeSH)
       Mental illness (HE)
       Psychological factors (HE)
       Psychosocial factors (HE)
       Self efficacy (HE)
       Sex behaviour
       Temperance (MeSH)
       Tobacco use
       Wit and humor (MeSH)

ALLIED HEALTH PERSONNEL
BT   Nutrition

RT   Body mass index
       Body size
       Caffeine
       Cardiovascular risk factors
       Cooking techniques
       Diet
       Dietary assessment
       Dietary guidelines
       Eating behaviour
       Eating disorders
       Food
       Fruits and vegetables (HE)
       Health behaviour
       Infant nutrition (HE)
       Menus
       Nutrition education
       Nutrition education programmesmes
       Nutritionists
       Obesity
       Parenteral nutrition
       Recipes
       Recommended dietary allowances
       Risk factor intervention
       Weight control
       Weight control programmesmes

AMERICAN PUBLIC HEALTH ASSOCIATION
BT   Health
RT   Behaviour change (HE)
       Behaviour modification (HE)
       Choice behaviour (MeSH)
       Chronic diseases and disorders (HE)
       Consumer health education
       Consumer health education programmesmes
       Family health (MeSH)
       Health attitude/Attitude to health (MeSH)
       Health behaviour (MeSH) (HE)
       Health beliefs (HE)
       Health care delivery (HE)
       Health care facilities (HE)
       Health care marketing (HE)
       Health care services (HE)
       Health clubs (HE)
       Health education (MeSH)
       Health education needs (HE)
       Health education objectives (HE)

Health education standards
(HE)
Health educator patient
relations (HE)
Health educators (MeSH) (HE)
Health facilities (MeSH)
Health fairs (MeSH) (HE)
Health field concept (HE)
Health informatics
Health literacy (HE)
Health knowledge, attitudes,
practice (MeSH)
Health messages (HE)
Health occupations (HE)
Health officers (HE)
Health personnel (HE)
Health plan implementation
(MeSH)
Health planning (HE)
Health priorities (MeSH)
Health professionals (HE)
Health promotion (MeSH) (HE)
Health resorts (MeSH)
Health risk appraisal (HE)
Health status (MeSH)
Health status indicators
(MeSH)
Health surveys (MeSH)
Health systems agencies (HE)
Health values (HE)
Health visitors (HE)
Healthy people 2010 (HE)
Healthy people
programmesmes (MeSH)
Holistic health (MeSH)
Information dissemination (HE)
Internet (HE)
Needs assessment (MeSH)
(HE)
Organisations (MeSH)
Philosophy (HE)
Preventive health services
(MeSH)
Preventive medicine
Primary prevention (SN altering
behaviour patterns detrimental
to health)
Problem solving
Public health
Quality of life
Risk reduction behaviour
(MeSH)
Risk-taking (MeSH)
Self-care (MeSH)
Stages of change (HE)

Values clarification (HE)
Value systems (HE)

ATTITUDES (HE)
BT   Loving relationships
RT   Attitude change (HE)
       Child care
       Children (HE)
       Christianity (HE)
       Communication problems (HE)
       Communication skills (HE)
       Coping (HE)
       Divorce (HE)
       Families (HE)
       Husbands
       Interpersonal skills (HE)
       Listening skills (HE)
       Marital status
       Mother child relations
       Parent child relations
       Parent responsibility
       Persuasion (HE)
       Psychological factors (HE)
       Psychosocial factors (HE)
       Religion (HE)
       Self concept (HE)
       Self efficacy (HE)
       Single parent families (HE)
       Wives

ATTITUDE CHANGE (HE)
BT   Life in balance
       Lifestyle
       Loving relationships
RT   Abstinence
       Addiction (?)
       Adjustment (HE)
       Alcohol use
       Attitudes (HE)
       Cardiovascular risk factors
       (HE)
       Child care
       Children (HE)
       Christianity (HE)
       Communication problems (HE)
       Communication skills (HE)
       Coping (HE)
       Decision-making
       Depression (HE)
       Divorce (HE)
       Drug use
       Empowerment (HE)
       Families (HE)
       Health behaviour
       Human sexuality

Husbands
Independent living (HE)
Interpersonal skills (HE)
Laughter (MeSH)
Laughter therapy (MeSH)
Listening skills (HE)
Marital status
Mental illness (HE)
Mother child relations
Parent child relations
Parent responsibility
Persuasion (HE)
Psychological factors (HE)
Psychosocial factors (HE)
Quality of life
Religion (HE)
Risk factor intervention
Self concept (HE)
Self efficacy (HE)
Sex behaviour
Single parent families (HE)
Temperance (MeSH)
Tobacco use
Wit and humor (MeSH)
Wives

ATTITUDES (HE)
BT   Lifestyle
RT   Adjustment
       Attitude change
       Decision-making
       Health behaviour (NT)
       Human sexuality
       Independent living
       Psychological factors
       Quality of life
       Risk factor intervention

BATHS
BT   Water
RT   Dehydration (MeSH)
       Drinking (MeSH)
       Drinking behaviour (MeSH)
       Hydration (?)
       Hydrotherapy (MeSH)
       Thirst (MeSH)
       Water purification (MeSH)

BEHAVIOUR CHANGE
BT   Health
RT   American Public Health
       Association
       Behaviour modification (HE)
       Choice behaviour (MeSH)

Chronic diseases and
disorders (HE)
Consumer health education
Consumer health education
programmesmes
Family health (MeSH)
Health attitude/Attitude to
health (MeSH)
Health behaviour (MeSH) (HE)
Health beliefs (HE)
Health care delivery (HE)
Health care facilities (HE)
Health care marketing (HE)
Health care services (HE)
Health clubs (HE)
Health education (MeSH)
Health education needs (HE)
Health education objectives
(HE)
Health education standards
(HE)
Health educator patient
relations (HE)
Health educators (MeSH) (HE)
Health facilities (MeSH)
Health fairs (MeSH) (HE)
Health field concept (HE)
Health informatics
Health literacy (HE)
Health knowledge, attitudes,
practice (MeSH)
Health messages (HE)
Health occupations (HE)
Health officers (HE)
Health personnel (HE)
Health plan implementation
(MeSH)
Health planning (HE)
Health priorities (MeSH)
Health professionals (HE)
Health promotion (MeSH) (HE)
Health resorts (MeSH)
Health risk appraisal (HE)
Health status (MeSH)
Health status indicators
(MeSH)
Health surveys (MeSH)
Health systems agencies (HE)
Health values (HE)
Health visitors (HE)
Healthy people 2010 (HE)
Healthy people
programmesmes (MeSH)
Holistic health (MeSH)
Information dissemination (HE)

Internet (HE)
Needs assessment (MeSH)
(HE)
Organisations (MeSH)
Philosophy (HE)
Preventive health services
(MeSH)
Preventive medicine
Primary prevention (SN altering
behaviour patterns detrimental
to health)
Problem solving
Public health
Quality of life
Risk reduction behaviour
(MeSH)
Risk-taking (MeSH)
Self-care (MeSH)
Stages of change (HE)
Values clarification (HE)
Value systems (HE)

BEHAVIOUR MODIFICATION
BT   Health
RT   American Public Health
        Association
        Behaviour change
        Choice behaviour (MeSH)
        Chronic diseases and
        disorders (HE)
        Consumer health education
        Consumer health education
        programmesmes
        Family health (MeSH)
        Health attitude/Attitude to
        health (MeSH)
        Health behaviour (MeSH) (HE)
        Health beliefs (HE)
        Health care delivery (HE)
        Health care facilities (HE)
        Health care marketing (HE)
        Health care services (HE)
        Health clubs (HE)
        Health education (MeSH)
        Health education needs (HE)
        Health education objectives
        (HE)
        Health education standards
        (HE)
        Health educator patient
        relations (HE)
        Health educators (MeSH) (HE)
        Health facilities (MeSH)
        Health fairs (MeSH) (HE)
        Health field concept (HE)

Health informatics
Health literacy (HE)
Health knowledge, attitudes,
practice (MeSH)
Health messages (HE)
Health occupations (HE)
Health officers (HE)
Health personnel (HE)
Health plan implementation
(MeSH)
Health planning (HE)
Health priorities (MeSH)
Health professionals (HE)
Health promotion (MeSH) (HE)
Health resorts (MeSH)
Health risk appraisal (HE)
Health status (MeSH)
Health status indicators
(MeSH)
Health surveys (MeSH)
Health systems agencies (HE)
Health values (HE)
Health visitors (HE)
Healthy people 2010 (HE)
Healthy people
programmesmes (MeSH)
Holistic health (MeSH)
Information dissemination (HE)
Internet (HE)
Needs assessment (MeSH)
(HE)
Organisations (MeSH)
Philosophy (HE)
Preventive health services
(MeSH)
Preventive medicine
Primary prevention (SN altering
behaviour patterns detrimental
to health)
Problem solving
Public health
Quality of life
Risk reduction behaviour
(MeSH)
Risk-taking (MeSH)
Self-care (MeSH)
Stages of change (HE)
Values clarification (HE)
Value systems (HE)

BODY MASS INDEX (HE)
BT   Exercise
        Nutrition
RT   Aerobic exercise (HE)
        Allied health personnel

Body size
Caffeine
Cardiovascular risk factors
Cooking techniques
Diet
Dietary assessment
Dietary guidelines
Eating behaviour
Eating disorders
Exercise movement techniques (MeSH)
Exercise test (MeSH)
Exercise testing (HE)
Exercise therapy (MeSH)
Exercise tolerance (MeSH)
Food
Fruits and vegetables (HE)
Health behaviour
Infant nutrition (HE)
Menus
Muscle fatigue (MeSH)
Nutrition education
Nutrition education programmesmes
Nutritionists
Obesity
Parenteral nutrition
Physical activity (HE)
Physical fitness (HE)

Recipes
Recommended dietary allowances
Risk factor intervention
Weight control
Weight control programmesmes

BODY SIZE (HE)
BT   Exercise
       Nutrition
RT   Aerobic exercise (HE)
       Allied health personnel
       Body mass index (HE)
       Caffeine
       Cardiovascular risk factors
       Cooking techniques
       Diet (HE)
       Dietary assessment
       Dietary guidelines
       Eating behaviour
       Eating disorders (HE)
       Exercise movement techniques (MeSH)

Exercise test (MeSH)
Exercise testing (HE)
Exercise therapy (MeSH)
Exercise tolerance (MeSH)
Food
Fruits and vegetables (HE)
Health behaviour (HE)
Infant nutrition (HE)
Menus
Muscle fatigue (MeSH)
Nutrition education
Nutrition education programmesmes
Nutritionists
Obesity (HE)
Parenteral nutrition
Physical activity (HE)
Physical fitness (HE)
Recipes
Recommended dietary allowances
Risk factor intervention (HE)
Weight control (HE)
Weight control programmesmes

BREATHING EXERCISES (MESH)
BT   Fresh Air
RT   Air (MeSH)
       Air ionisation (MeSH)
       Air pollutants (MeSH)
       Respiration (MeSH)

BURNS (HE)
BT   Sunlight
RT   Dermatology (HE)
       Skin diseases and disorders (HE)
       Sun exposure (HE)
       Sun sensitivity (HE)
       Sunburn (HE)
       Sunlight (HE)
       Sunscreening agents (HE)
       Sunstroke (MeSH)
       Tanning booths (HE)
       Ultraviolet radiation (HE)

CAFFEINE
BT   Nutrition
RT   Allied health personnel
       Body mass index
       Body size
       Cardiovascular risk factors
       Cooking techniques
       Diet

Dietary assessment
Dietary guidelines
Eating behaviour
Eating disorders
Food
Fruits and vegetables (HE)
Health behaviour
Infant nutrition (HE)
Menus
Nutrition education
Nutrition education
programmes
Nutritionists
Obesity
Parenteral nutrition
Recipes
Recommended dietary
allowances
Risk factor intervention
Weight control
Weight control programmess

Menus
Nutrition education
Nutrition education
programmess
Nutritionists
Obesity
Parenteral nutrition
Psychological factors (HE)
Psychosocial factors (HE)
Recipes
Recommended dietary
allowances
Risk factor intervention
Self efficacy (HE)
Sex behaviour
Temperance (MeSH)
Tobacco use
Weight control
Weight control programmess
Wit and humor (MeSH)

CARDIOVASCULAR RISK FACTORS
BT   Life in balance
       Nutrition
RT   Abstinence
       Addiction (?)
       Adjustment (HE)
       Alcohol use
       Allied health personnel
       Attitude change (HE)
       Body mass index
       Body size
       Caffeine
       Cooking techniques
       Coping
       Depression
       Diet
       Dietary assessment
       Dietary guidelines
       Drug use
       Eating behaviour
       Eating disorders
       Empowerment (HE)

       Food
       Fruits and vegetables (HE)
       Health behaviour
       Human sexuality
       Independent living (HE)
       Infant nutrition (HE)
       Laughter (MeSH)
       Laughter therapy (MeSH)
       Mental illness (HE)

CHILD CARE
BT   Loving relationships
RT   Attitude change (HE)
       Attitudes (HE)
       Children (HE)
       Christianity (HE)
       Communication problems (HE)
       Communication skills (HE)
       Coping (HE)
       Divorce (HE)
       Families (HE)
       Husbands
       Interpersonal skills (HE)
       Listening skills (HE)
       Marital status
       Mother child relations
       Parent child relations
       Parent responsibility
       Persuasion (HE)
       Psychological factors (HE)
       Psychosocial factors (HE)
       Religion (HE)
       Self concept (HE)
       Self efficacy (HE)
       Single parent families (HE)
       Wives

CHILDREN (HE)
BT   Loving relationships
RT   Attitude change (HE)
       Attitudes (HE)
       Child care
       Christianity (HE)
       Communication problems (HE)

Communication skills (HE)
Coping (HE)
Divorce (HE)
Families (HE)
Husbands
Interpersonal skills (HE)
Listening skills (HE)
Marital status
Mother child relations
Parent child relations
Parent responsibility
Persuasion (HE)
Psychological factors (HE)
Psychosocial factors (HE)
Religion (HE)
Self concept (HE)
Self efficacy (HE)
Single parent families (HE)
Wives

CHOICE BEHAVIOUR
BT   Health
RT   American Public Health
Association
Behaviour change
Behaviour modification
Chronic diseases and
disorders (HE)
Consumer health education
Consumer health education
programmess
Family health (MeSH)
Health attitude/Attitude to
health (MeSH)
Health behaviour (MeSH) (HE)
Health beliefs (HE)
Health care delivery (HE)
Health care facilities (HE)
Health care marketing (HE)
Health care services (HE)
Health clubs (HE)
Health education (MeSH)
Health education needs (HE)
Health education objectives
(HE)
Health education standards
(HE)
Health educator patient
relations (HE)
Health educators (MeSH) (HE)
Health facilities (MeSH)
Health fairs (MeSH) (HE)
Health field concept (HE)
Health informatics
Health literacy (HE)

Health knowledge, attitudes,
practice (MeSH)
Health messages (HE)
Health occupations (HE)
Health officers (HE)
Health personnel (HE)
Health plan implementation
(MeSH)
Health planning (HE)
Health priorities (MeSH)
Health professionals (HE)
Health promotion (MeSH) (HE)
Health resorts (MeSH)
Health risk appraisal (HE)
Health status (MeSH)
Health status indicators
(MeSH)
Health surveys (MeSH)
Health systems agencies (HE)
Health values (HE)
Health visitors (HE)
Healthy people 2010 (HE)
Healthy people programmess
(MeSH)
Holistic health (MeSH)
Information dissemination (HE)
Internet (HE)
Needs assessment (MeSH)
(HE)
Organisations (MeSH)
Philosophy (HE)
Preventive health services
(MeSH)
Preventive medicine
Primary prevention (SN altering
behaviour patterns detrimental
to health)
Problem solving
Public health
Quality of life
Risk reduction behaviour
(MeSH)
Risk-taking (MeSH)
Self-care (MeSH)
Stages of change (HE)
Values clarification (HE)
Value systems (HE)

CHRISTIANITY (HE)
BT   Loving relationships
RT   Attitude change (HE)
Attitudes (HE)
Child care
Children (HE)
Communication problems (HE)

Communication skills (HE)
Coping (HE)
Divorce (HE)
Families (HE)
Husbands
Interpersonal skills (HE)
Listening skills (HE)
Marital status
Mother child relations
Parent child relations
Parent responsibility
Persuasion (HE)
Psychological factors (HE)
Psychosocial factors (HE)
Religion (HE)
Self concept (HE)
Self efficacy (HE)
Single parent families (HE)
Wives

CHRONIC DISEASES AND DISORDERS
BT   Health
RT   American Public Health
     Association (MeSH)
     Behaviour change (HE)
     Behaviour modification (HE)
     Choice behaviour (MeSH)
     Consumer health education
     Consumer health education
     programmess
     Family health (MeSH)
     Health attitude/Attitude to
     health (MeSH)
     Health behaviour (MeSH) (HE)
     Health beliefs (HE)
     Health care delivery (HE)
     Health care facilities (HE)
     Health care marketing (HE)
     Health care services (HE)
     Health clubs (HE)
     Health education (MeSH)
     Health education needs (HE)
     Health education objectives
     (HE)
     Health education standards
     (HE)
     Health educator patient
     relations (HE)
     Health educators (MeSH) (HE)
     Health facilities (MeSH)
     Health fairs (MeSH) (HE)
     Health field concept (HE)
     Health informatics
     Health literacy (HE)

Health knowledge, attitudes,
practice (MeSH)
Health messages (HE)
Health occupations (HE)
Health officers (HE)
Health personnel (HE)
Health plan implementation
(MeSH)
Health planning (HE)
Health priorities (MeSH)
Health professionals (HE)
Health promotion (MeSH) (HE)
Health resorts (MeSH)
Health risk appraisal (HE)
Health status (MeSH)
Health status indicators
(MeSH)
Health surveys (MeSH)
Health systems agencies (HE)
Health values (HE)
Health visitors (HE)
Healthy people 2010 (HE)
Healthy people programmess
(MeSH)
Holistic health (MeSH)
Information dissemination (HE)
Internet (HE)
Needs assessment (MeSH)
(HE)
Organisations (MeSH)
Philosophy (HE)
Preventive health services
(MeSH)
Preventive medicine
Primary prevention (SN altering
behaviour patterns detrimental
to health)
Problem solving
Public health
Quality of life
Risk reduction behaviour
(MeSH)
Risk-taking (MeSH)
Self-care (MeSH)
Stages of change (HE)
Values clarification (HE)
Value systems (HE)

CHRONIC DISEASE PREVENTION
BT   Disease prevention

COMMUNICATION PROBLEMS (HE)
BT   Loving relationships
RT   Attitude change (HE)
     Attitudes (HE)

Child care
Children (HE)
Christianity (HE)
Communication skills (HE)
Coping (HE)
Divorce (HE)
Families (HE)
Husbands
Interpersonal skills (HE)
Listening skills (HE)
Marital status
Mother child relations
Parent child relations
Parent responsibility
Persuasion (HE)
Psychological factors (HE)
Psychosocial factors (HE)
Religion (HE)
Self concept (HE)
Self efficacy (HE)
Single parent families (HE)
Wives

COMMUNICATION SKILLS (HE)
BT   Loving relationships
RT   Attitude change (HE)
       Attitudes (HE)
       Child care
       Children (HE)
       Christianity (HE)
       Communication problems (HE)
       Coping (HE)
       Divorce (HE)
       Families (HE)
       Husbands
       Interpersonal skills (HE)
       Listening skills (HE)
       Marital status
       Mother child relations
       Parent child relations
       Parent responsibility
       Persuasion (HE)
       Psychological factors (HE)
       Psychosocial factors (HE)
       Religion (HE)
       Self concept (HE)
       Self efficacy (HE)
       Single parent families (HE)
       Wives

CONSUMER HEALTH EDUCATION
BT   Health
RT   American Public Health
       Association (MeSH)
       Behaviour change (HE)

Behaviour modification (HE)
Choice behaviour (MeSH)
Consumer health education
programmess
Family health (MeSH)
Health attitude/Attitude to
health (MeSH)
Health behaviour (MeSH) (HE)
Health beliefs (HE)
Health care delivery (HE)
Health care facilities (HE)
Health care marketing (HE)
Health care services (HE)
Health clubs (HE)
Health education (MeSH)
Health education needs (HE)
Health education objectives
(HE)
Health education standards
(HE)
Health educator patient
relations (HE)
Health educators (MeSH) (HE)
Health facilities (MeSH)
Health fairs (MeSH) (HE)
Health field concept (HE)
Health informatics
Health literacy (HE)
Health knowledge, attitudes,
practice (MeSH)
Health messages (HE)
Health occupations (HE)
Health officers (HE)
Health personnel (HE)
Health plan implementation
(MeSH)
Health planning (HE)
Health priorities (MeSH)
Health professionals (HE)
Health promotion (MeSH) (HE)
Health resorts (MeSH)
Health risk appraisal (HE)
Health status (MeSH)
Health status indicators
(MeSH)
Health surveys (MeSH)
Health systems agencies (HE)
Health values (HE)
Health visitors (HE)
Healthy people 2010 (HE)
Healthy people programmess
(MeSH)
Holistic health (MeSH)
Information dissemination (HE)
Internet (HE)

Needs assessment (MeSH)
(HE)
Organisations (MeSH)
Philosophy (HE)
Preventive health services
(MeSH)
Preventive medicine
Primary prevention (SN altering
behaviour patterns detrimental
to health)
Problem solving
Public health
Quality of life
Risk reduction behaviour
(MeSH)
Risk-taking (MeSH)
Self-care (MeSH)
Stages of change (HE)
Values clarification (HE)
Value systems (HE)

**CONSUMER HEALTH EDUCATION
PROGRAMMESS**
BT   Health
RT   American Public Health
      Association (MeSH)
      Behaviour change (HE)
      Behaviour modification (HE)
      Choice behaviour (MeSH)
      Consumer health education
      Family health (MeSH)
      Health attitude/Attitude to
      health (MeSH)
      Health behaviour (MeSH) (HE)
      Health beliefs (HE)
      Health care delivery (HE)
      Health care facilities (HE)
      Health care marketing (HE)
      Health care services (HE)
      Health clubs (HE)
      Health education (MeSH)
      Health education needs (HE)
      Health education objectives
      (HE)
      Health education standards
      (HE)
      Health educator patient
      relations (HE)
      Health educators (MeSH) (HE)
      Health facilities (MeSH)
      Health fairs (MeSH) (HE)
      Health field concept (HE)
      Health informatics
      Health literacy (HE)

Health knowledge, attitudes,
practice (MeSH)
Health messages (HE)
Health occupations (HE)
Health officers (HE)
Health personnel (HE)
Health plan implementation
(MeSH)
Health planning (HE)
Health priorities (MeSH)
Health professionals (HE)
Health promotion (MeSH) (HE)
Health resorts (MeSH)
Health risk appraisal (HE)
Health status (MeSH)
Health status indicators
(MeSH)
Health surveys (MeSH)
Health systems agencies (HE)
Health values (HE)
Health visitors (HE)
Healthy people 2010 (HE)
Healthy people programmess
(MeSH)
Holistic health (MeSH)
Information dissemination (HE)
Internet (HE)
Needs assessment (MeSH)
(HE)
Organisations (MeSH)
Philosophy (HE)
Preventive health services
(MeSH)
Preventive medicine
Primary prevention (SN altering
behaviour patterns detrimental
to health)
Problem solving
Public health
Quality of life
Risk reduction behaviour
(MeSH)
Risk-taking (MeSH)
Self-care (MeSH)
Stages of change (HE)
Values clarification (HE)
Value systems (HE)

COOKING TECHNIQUES
BT   Nutrition
RT   Allied health personnel
      Body mass index
      Body size
      Caffeine
      Cardiovascular risk factors

Diet
Dietary assessment
Dietary guidelines
Eating behaviour
Eating disorders
Food
Fruits and vegetables (HE)
Health behaviour
Infant nutrition (HE)
Menus
Nutrition education
Nutrition education
programmess
Nutritionists
Obesity
Parenteral nutrition
Recipes
Recommended dietary
allowances
Risk factor intervention
Weight control
Weight control programmess

COPING (HE)
BT   Life in balance
       Loving relationships
RT   Abstinence
       Addiction (?)
       Adjustment (HE)
       Alcohol use
       Attitude change (HE)
       Attitudes (HE)
       Cardiovascular risk factors
       (HE)
       Child care
       Children (HE)
       Christianity (HE)
       Communication problems (HE)
       Communication skills (HE)
       Depression (HE)
       Divorce (HE)
       Drug use
       Empowerment (HE)
       Families (HE)
       Health behaviour
       Human sexuality
       Husbands
       Independent living (HE)
       Interpersonal skills (HE)
       Laughter (MeSH)
       Laughter therapy (MeSH)
       Listening skills (HE)
       Marital status
       Mental illness (HE)
       Mother child relations

Parent child relations
Parent responsibility
Persuasion (HE)
Psychological factors (HE)
Psychosocial factors (HE)
Religion (HE)
Self concept (HE)
Self efficacy (HE)
Sex behaviour
Single parent families (HE)
Temperance (MeSH)
Tobacco use
Wit and humor (MeSH)
Wives

DECISION-MAKING (HE)
BT   Lifestyle
RT   Adjustment
       Attitude change
       Attitudes
       Health behaviour (NT)
       Human sexuality
       Independent living
       Psychological factors
       Quality of life
       Risk factor intervention

DEHYDRATION
BT   Water
RT   Baths (MeSH)
       Drinking (MeSH)
       Drinking behaviour (MeSH)
       Hydration (?)
       Hydrotherapy (MeSH)
       Thirst (MeSH)
       Water purification (MeSH)

DEPRESSION (HE)
BT   Life in balance
RT   Abstinence
       Addiction (?)
       Adjustment (HE)
       Alcohol use
       Attitude change (HE)
       Cardiovascular risk factors
       (HE)
       Coping (HE)
       Drug use
       Empowerment (HE)
       Health behaviour
       Human sexuality
       Independent living (HE)
       Laughter (MeSH)
       Laughter therapy (MeSH)
       Mental illness (HE)

Psychological factors (HE)
Psychosocial factors (HE)
Self efficacy (HE)
Sex behaviour
Temperance (MeSH)
Tobacco use
Wit and humor (MeSH)

Physical fitness (HE)
Recipes
Recommended dietary
allowances
Risk factor intervention (HE)
Weight control (HE)
Weight control programmess

DERMATOLOGY (HE)
BT   Sunlight
RT   Burns (HE)
     Skin diseases and disorders
     (HE)
     Sun exposure (HE)
     Sun sensitivity (HE)
     Sunburn (HE)
     Sunlight (HE)
     Sunscreening agents (HE)
     Sunstroke (MeSH)
     Tanning booths (HE)
     Ultraviolet radiation (HE)

DIET (HE)
BT   Exercise
     Nutrition
RT   Aerobic exercise (HE)
     Allied health personnel
     Body mass index (HE)
     Body size (HE)
     Caffeine
     Cardiovascular risk factors
     Cooking techniques
     Dietary assessment
     Dietary guidelines
     Eating behaviour
     Eating disorders (HE)
     Exercise movement techniques
     (MeSH)
     Exercise test (MeSH)
     Exercise testing (HE)
     Exercise therapy (MeSH)
     Exercise tolerance (MeSH)
     Food
     Fruits and vegetables (HE)
     Health behaviour (HE)
     Infant nutrition (HE)
     Menus
     Muscle fatigue (MeSH)
     Nutrition education
     Nutrition education
     programmess
     Nutritionists
     Obesity (HE)
     Parenteral nutrition
     Physical activity (HE)

DIETARY ASSESSMENT
BT   Nutrition
RT   Allied health personnel
     Body mass index
     Body size
     Caffeine
     Cardiovascular risk factors
     Cooking techniques
     Diet
     Dietary guidelines
     Eating behaviour
     Eating disorders
     Food
     Fruits and vegetables (HE)
     Health behaviour
     Infant nutrition (HE)
     Menus
     Nutrition education
     Nutrition education
     programmess
     Nutritionists
     Obesity
     Parenteral nutrition
     Recipes
     Recommended dietary
     allowances
     Risk factor intervention
     Weight control
     Weight control programmess

DIETARY GUIDELINES
BT   Nutrition
RT   Allied health personnel
     Body mass index
     Body size
     Caffeine
     Cardiovascular risk factors
     Cooking techniques
     Diet
     Dietary assessment
     Eating behaviour
     Eating disorders
     Food
     Fruits and vegetables (HE)
     Health behaviour
     Infant nutrition (HE)
     Menus

Nutrition education
Nutrition education
programmess
Nutritionists
Obesity
Parenteral nutrition
Recipes
Recommended dietary
allowances
Risk factor intervention
Weight control
Weight control programmess

DISEASE PREVENTION
BT   Wellness
NT   Chronic disease prevention

DIVORCE (HE)
BT   Loving relationships
RT   Attitude change (HE)
       Attitudes (HE)
       Child care
       Children (HE)
       Christianity (HE)
       Communication problems (HE)
       Communication skills (HE)
       Coping (HE)
       Families (HE)
       Husbands
       Interpersonal skills (HE)
       Listening skills (HE)
       Marital status
       Mother child relations
       Parent child relations
       Parent responsibility
       Persuasion (HE)
       Psychological factors (HE)
       Psychosocial factors (HE)
       Religion (HE)
       Self concept (HE)
       Self efficacy (HE)
       Single parent families (HE)
       Wives

DRINKING
BT   Water
RT   Baths (MeSH)
       Dehydration (MeSH)
       Drinking behaviour (MeSH)
       Hydration (?)
       Hydrotherapy (MeSH)
       Thirst (MeSH)
       Water purification (MeSH)

DRINKING BEHAVIOUR
BT   Water

RT   Baths (MeSH)
       Dehydration (MeSH)
       Drinking (MeSH)
       Hydration (?)
       Hydrotherapy (MeSH)
       Thirst (MeSH)
       Water purification (MeSH)

DRUG USE
BT   Life in balance
RT   Abstinence
       Addiction (?)
       Adjustment (HE)
       Alcohol use
       Attitude change (HE)
       Cardiovascular risk factors
       (HE)
       Coping (HE)
       Depression (HE)
       Empowerment (HE)
       Health behaviour
       Human sexuality
       Independent living (HE)
       Laughter (MeSH)
       Laughter therapy (MeSH)
       Mental illness (HE)
       Psychological factors (HE)
       Psychosocial factors (HE)
       Self efficacy (HE)
       Sex behaviour
       Temperance (MeSH)
       Tobacco use
       Wit and humor (MeSH)

EATING BEHAVIOUR
BT   Nutrition
RT   Allied health personnel
       Body mass index
       Body size
       Caffeine
       Cardiovascular risk factors
       Cooking techniques
       Diet
       Dietary assessment
       Dietary guidelines
       Eating disorders
       Food
       Fruits and vegetables (HE)
       Health behaviour
       Infant nutrition (HE)
       Menus
       Nutrition education
       Nutrition education
       programmess
       Nutritionists

Obesity
Parenteral nutrition
Recipes
Recommended dietary allowances
Risk factor intervention
Weight control
Weight control programmess

EATING DISORDERS
BT   Exercise
      Nutrition
RT   Aerobic exercise (HE)
      Allied health personnel
      Body mass index
      Body size
      Caffeine
      Cardiovascular risk factors
      Cooking techniques
      Diet
      Dietary assessment
      Dietary guidelines
      Eating behaviour
      Exercise movement techniques (MeSH)
      Exercise test (MeSH)
      Exercise testing (HE)
      Exercise therapy (MeSH)
      Exercise tolerance (MeSH)
      Food
      Fruits and vegetables (HE)
      Health behaviour
      Infant nutrition (HE)
      Menus
      Muscle fatigue (MeSH)
      Nutrition education
      Nutrition education programmess
      Nutritionists
      Obesity
      Parenteral nutrition
      Physical activity (HE)
      Physical fitness (HE)
      Recipes
      Recommended dietary allowances
      Risk factor intervention
      Weight control
      Weight control programmess

ECOLOGICAL PERSPECTIVE (HE)
SN   An approach to health education that underscores the importance of the social,

economic, and political environment, as well as the relevance of personal decision-making in determining individual well-being (HE)
BT   Wellness
RT   Health promotion
      Holistic approach
      Morbidity

EMPOWERMENT (HE)
BT   Life in balance
RT   Abstinence
      Addiction (?)
      Adjustment (HE)
      Alcohol use
      Attitude change (HE)
      Cardiovascular risk factors (HE)
      Coping (HE)
      Depression (HE)
      Drug use
      Health behaviour
      Human sexuality
      Independent living (HE)
      Laughter (MeSH)
      Laughter therapy (MeSH)
      Mental illness (HE)
      Psychological factors (HE)
      Psychosocial factors (HE)
      Self efficacy (HE)
      Sex behaviour
      Temperance (MeSH)
      Tobacco use
      Wit and humor (MeSH)

ENJOY ADEQUATE REST AND RELAXATION
See REST
See RELAXATION

EXERCISE
NT   Aerobic exercise (HE)
      Body mass index (HE)
      Body size (HE)
      Diet (HE)
      Eating disorders (HE)
      Exercise movement techniques (MeSH)
      Exercise test (MeSH)
      Exercise testing (HE)
      Exercise therapy (MeSH)
      Exercise tolerance (MeSH)
      Health behaviour (HE)
      Muscle fatigue (MeSH)

Obesity (HE)
Physical activity (HE)
Physical fitness (HE)
Risk factor intervention (HE)
Weight control (HE)

EXERCISE MOVEMENT TECHNIQUES (MESH)
BT   Exercise
RT   Aerobic exercise (HE)
Body mass index (HE)
Body size (HE)
Diet (HE)
Eating disorders (HE)
Exercise test (MeSH)
Exercise testing (HE)
Exercise therapy (MeSH)
Exercise tolerance (MeSH)
Health behaviour (HE)
Muscle fatigue (MeSH)
Obesity (HE)
Physical activity (HE)
Physical fitness (HE)
Risk factor intervention (HE)
Weight control (HE)

EXERCISE TEST (MESH)
BT   Exercise
RT   Aerobic exercise (HE)
Body mass index (HE)
Body size (HE)
Diet (HE)
Eating disorders (HE)
Exercise movement techniques (MeSH)
Exercise testing (HE)
Exercise therapy (MeSH)
Exercise tolerance (MeSH)
Health behaviour (HE)
Muscle fatigue (MeSH)
Obesity (HE)
Physical activity (HE)
Physical fitness (HE)
Risk factor intervention (HE)
Weight control (HE)

EXERCISE TESTING (HE)
BT   Exercise
RT   Aerobic exercise (HE)
Body mass index (HE)
Body size (HE)
Diet (HE)
Eating disorders (HE)
Exercise movement techniques (MeSH)

Exercise test (MeSH)
Exercise therapy (MeSH)
Exercise tolerance (MeSH)
Health behaviour (HE)
Muscle fatigue (MeSH)
Obesity (HE)
Physical activity (HE)
Physical fitness (HE)
Risk factor intervention (HE)
Weight control (HE)

EXERCISE THERAPY (MESH)
BT   Exercise
RT   Aerobic exercise (HE)
Body mass index (HE)
Body size (HE)
Diet (HE)
Eating disorders (HE)
Exercise movement techniques (MeSH)
Exercise test (MeSH)
Exercise testing (HE)
Exercise tolerance (MeSH)
Health behaviour (HE)
Muscle fatigue (MeSH)
Obesity (HE)
Physical activity (HE)
Physical fitness (HE)
Risk factor intervention (HE)
Weight control (HE)

EXERCISE TOLERANCE (MESH)
BT   Exercise
RT   Aerobic exercise (HE)
Body mass index (HE)
Body size (HE)
Diet (HE)
Eating disorders (HE)
Exercise movement techniques (MeSH)
Exercise test (MeSH)
Exercise testing (HE)
Exercise therapy (MeSH)
Health behaviour (HE)
Muscle fatigue (MeSH)
Obesity (HE)
Physical activity (HE)
Physical fitness (HE)
Risk factor intervention (HE)
Weight control (HE)

FAMILIES (HE)
BT   Loving relationships
RT   Attitude change (HE)
Attitudes (HE)

Child care
Children (HE)
Christianity (HE)
Communication problems (HE)
Communication skills (HE)
Coping (HE)
Divorce (HE)
Husbands
Interpersonal skills (HE)
Listening skills (HE)
Marital status
Mother child relations
Parent child relations
Parent responsibility
Persuasion (HE)
Psychological factors (HE)
Psychosocial factors (HE)
Religion (HE)
Self concept (HE)
Self efficacy (HE)
Single parent families (HE)
Wives

FAMILY HEALTH
BT   Health
RT   American Public Health
      Association (MeSH)
      Behaviour change (HE)
      Behaviour modification (HE)
      Choice behaviour (MeSH)
      Chronic diseases and
      disorders (HE)
      Consumer health education
      Consumer health education
      programmess
      Health attitude/Attitude to
      health (MeSH)
      Health behaviour (MeSH) (HE)
      Health beliefs (HE)
      Health care delivery (HE)
      Health care facilities (HE)
      Health care marketing (HE)
      Health care services (HE)
      Health clubs (HE)
      Health education (MeSH)
      Health education needs (HE)
      Health education objectives
      (HE)
      Health education standards
      (HE)
      Health educator patient
      relations (HE)
      Health educators (MeSH) (HE)
      Health facilities (MeSH)
      Health fairs (MeSH) (HE)

Health field concept (HE)
Health informatics
Health literacy (HE)
Health knowledge, attitudes,
practice (MeSH)
Health messages (HE)
Health occupations (HE)
Health officers (HE)
Health personnel (HE)
Health plan implementation
(MeSH)
Health planning (HE)
Health priorities (MeSH)
Health professionals (HE)
Health promotion (MeSH) (HE)
Health resorts (MeSH)
Health risk appraisal (HE)
Health status (MeSH)
Health status indicators
(MeSH)
Health surveys (MeSH)
Health systems agencies (HE)
Health values (HE)
Health visitors (HE)
Healthy people 2010 (HE)
Healthy people programmess
(MeSH)
Holistic health (MeSH)
Information dissemination (HE)
Internet (HE)
Needs assessment (MeSH)
(HE)
Organisations (MeSH)
Philosophy (HE)
Preventive health services
(MeSH)
Preventive medicine
Primary prevention (SN altering
behaviour patterns detrimental
to health)
Problem solving
Public health
Quality of life
Risk reduction behaviour
(MeSH)
Risk-taking (MeSH)
Self-care (MeSH)
Stages of change (HE)
Values clarification (HE)
Value systems (HE)

FEMALES
UF   Women
NT   Mothers
      Pregnant women

Wives
RT   Womens health
         Womens health programmess

FOOD
BT   Nutrition
RT   Allied health personnel
         Body mass index
         Body size
         Caffeine
         Cardiovascular risk factors
         Cooking techniques
         Diet
         Dietary assessment
         Dietary guidelines
         Eating behaviour
         Eating disorders
         Fruits and vegetables (HE)
         Health behaviour
         Infant nutrition (HE)
         Menus
         Nutrition education
         Nutrition education
         programmess
         Nutritionists
         Obesity
         Parenteral nutrition
         Recipes
         Recommended dietary
         allowances
         Risk factor intervention
         Weight control
         Weight control programmess

FRESH AIR
NT   Air (MeSH)
         Air ionisation (MeSH)
         Air pollutants (MeSH)
         Breathing exercises (MeSH)
         Respiration (MeSH)

FRUITS AND VEGETABLES (HE)
BT   Nutrition
RT   Allied health personnel
         Body mass index
         Body size
         Caffeine
         Cardiovascular risk factors
         Cooking techniques
         Diet
         Dietary assessment
         Dietary guidelines
         Eating behaviour
         Eating disorders
         Food

         Health behaviour
         Infant nutrition (HE)
         Menus
         Nutrition education
         Nutrition education
         programmess
         Nutritionists
         Obesity
         Parenteral nutrition
         Recipes
         Recommended dietary
         allowances
         Risk factor intervention
         Weight control
         Weight control programmess

HEALTH (MeSH)
BT   Wellness
NT   American Public Health
         Association (MeSH)
         Behaviour change (HE)
         Behaviour modification (HE)
         Choice behaviour (MeSH)
         Chronic diseases and
         disorders (HE)
         Consumer health education
         Consumer health education
         programmess
         Family health (MeSH)
         Health attitude/Attitude to
         health (MeSH)
         Health behaviour (MeSH) (HE)
         Health beliefs (HE)
         Health care delivery (HE)
         Health care facilities (HE)
         Health care marketing (HE)
         Health care services (HE)
         Health clubs (HE)
         Health education (MeSH)
         Health education needs (HE)
         Health education objectives
         (HE)
         Health education standards
         (HE)
         Health educator patient
         relations (HE)
         Health educators (MeSH) (HE)
         Health facilities (MeSH)
         Health fairs (MeSH) (HE)
         Health field concept (HE)
         Health informatics
         Health literacy (HE)
         Health knowledge, attitudes,
         practice (MeSH)
         Health messages (HE)

Health occupations (HE)
Health officers (HE)
Health personnel (HE)
Health plan implementation
(MeSH)
Health planning (HE)
Health priorities (MeSH)
Health professionals (HE)
Health promotion (MeSH) (HE)
Health resorts (MeSH)
Health risk appraisal (HE)
Health status (MeSH)
Health status indicators
(MeSH)
Health surveys (MeSH)
Health systems agencies (HE)
Health values (HE)
Health visitors (HE)
Healthy people 2010 (HE)
Healthy people programmess
(MeSH)
Holistic health (MeSH)
Information dissemination (HE)
Internet (HE)
Needs assessment (MeSH)
(HE)
Organisations (MeSH)
Philosophy (HE)
Preventive health services
(MeSH)
Preventive medicine
Primary prevention (SN altering
behaviour patterns detrimental
to health)
Problem solving
Public health
Quality of life
Risk reduction behaviour
(MeSH)
Risk-taking (MeSH)
Self-care (MeSH)
Stages of change (HE)
Values clarification (HE)
Value systems (HE)

**HEALTH ATTITUDE/ATTITUDE TO
HEALTH (MESH)**
BT   Health
RT   American Public Health
      Association (MeSH)
      Behaviour change (HE)
      Behaviour modification (HE)
      Choice behaviour (MeSH)
      Chronic diseases and
      disorders (HE)

Consumer health education
Consumer health education
programmess
Family health (MeSH)
Health behaviour (MeSH) (HE)
Health beliefs (HE)
Health care delivery (HE)
Health care facilities (HE)
Health care marketing (HE)
Health care services (HE)
Health clubs (HE)
Health education (MeSH)
Health education needs (HE)
Health education objectives
(HE)
Health education standards
(HE)
Health educator patient
relations (HE)
Health educators (MeSH) (HE)
Health facilities (MeSH)
Health fairs (MeSH) (HE)
Health field concept (HE)
Health informatics
Health literacy (HE)
Health knowledge, attitudes,
practice (MeSH)
Health messages (HE)
Health occupations (HE)
Health officers (HE)
Health personnel (HE)
Health plan implementation
(MeSH)
Health planning (HE)
Health priorities (MeSH)
Health professionals (HE)
Health promotion (MeSH) (HE)
Health resorts (MeSH)
Health risk appraisal (HE)
Health status (MeSH)
Health status indicators
(MeSH)
Health surveys (MeSH)
Health systems agencies (HE)
Health values (HE)
Health visitors (HE)
Healthy people 2010 (HE)
Healthy people programmess
(MeSH)
Holistic health (MeSH)
Information dissemination (HE)
Internet (HE)
Needs assessment (MeSH)
(HE)
Organisations (MeSH)

Philosophy (HE)
Preventive health services
(MeSH)
Preventive medicine
Primary prevention (SN altering
behaviour patterns detrimental
to health)
Problem solving
Public health
Quality of life
Risk reduction behaviour
(MeSH)
Risk-taking (MeSH)
Self-care (MeSH)
Stages of change (HE)
Values clarification (HE)
Value systems (HE)

HEALTH BEHAVIOUR (MESH) (HE)
BT   Exercise
      Health
      Life in balance
      Lifestyle
      Nutrition
RT   Abstinence
      Addiction
      Adjustment (HE)
      Aerobic exercise (HE)
      Alcohol use
      Allied health personnel
      American Public Health
      Association (MeSH)
      Attitude change (HE)
      Attitudes
      Behaviour change (HE)
      Behaviour modification (HE)
      Body mass index (HE)
      Body size (HE)
      Caffeine
      Cardiovascular risk factors
      Choice behaviour (MeSH)
      Chronic diseases and
      disorders (HE)
      Consumer health education
      Consumer health education
      programmess
      Cooking techniques
      Coping (HE)
      Decision-making
      Depression (HE)
      Diet (HE)
      Dietary assessment
      Dietary guidelines
      Drug use
      Eating behaviour

Eating disorders
Empowerment (HE)
Exercise movement techniques
(MeSH)
Exercise test (MeSH)
Exercise testing (HE)
Exercise therapy (MeSH)
Exercise tolerance (MeSH)
Family health (MeSH)
Food
Fruits and vegetables (HE)
Health attitude/Attitude to
health (MeSH)
Health beliefs (HE)
Health care delivery (HE)
Health care facilities (HE)
Health care marketing (HE)
Health care services (HE)
Health clubs (HE)
Health education (MeSH)
Health education needs (HE)
Health education objectives
(HE)
Health education standards
(HE)
Health educator patient
relations (HE)
Health educators (MeSH) (HE)
Health facilities (MeSH)
Health fairs (MeSH) (HE)
Health field concept (HE)
Health informatics
Health literacy (HE)
Health knowledge, attitudes,
practice (MeSH)
Health messages (HE)
Health occupations (HE)
Health officers (HE)
Health personnel (HE)
Health plan implementation
(MeSH)
Health planning (HE)
Health priorities (MeSH)
Health professionals (HE)
Health promotion (MeSH) (HE)
Health resorts (MeSH)
Health risk appraisal (HE)
Health status (MeSH)
Health status indicators
(MeSH)
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Health systems agencies (HE)
Health values (HE)
Health visitors (HE)
Healthy people 2010 (HE)

Healthy people programmess (MeSH)
Holistic health (MeSH)
Human sexuality
Independent living
Infant nutrition (HE)
Information dissemination (HE)
Internet (HE)
Laughter (MeSH)
Laughter therapy (MeSH)
Mental illness (HE)
Menus
Muscle fatigue (MeSH)
Needs assessment (MeSH) (HE)
Nutrition education
Nutrition education programmess
Nutritionists
Obesity (HE)
Organisations (MeSH)
Parenteral nutrition
Philosophy (HE)
Physical activity (HE)
Physical fitness (HE)
Preventive health services (MeSH)
Preventive medicine
Primary prevention (SN altering behaviour patterns detrimental to health)
Problem solving
Psychological factors
Psychosocial factors (HE)
Public health
Quality of life
Recipes
Recommended dietary allowances
Risk factor intervention
Risk reduction behaviour (MeSH)
Risk-taking (MeSH)
Self-care (MeSH)
Self efficacy (HE)
Sex behaviour
Stages of change (HE)
Temperance (MeSH)
Tobacco use
Values clarification (HE)
Value systems (HE)
Weight control (HE)
Weight control programmess
Wit and humor (MeSH)

HEALTH BELIEFS (HE)
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RT   American Public Health Association (MeSH)
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      Behaviour modification (HE)
      Choice behaviour (MeSH)
      Chronic diseases and disorders (HE)
      Consumer health education
      Consumer health education programmess
      Family health (MeSH)
      Health attitude/Attitude to health (MeSH)
      Health behaviour (MeSH) (HE)
      Health care delivery (HE)
      Health care facilities (HE)
      Health care marketing (HE)
      Health care services (HE)
      Health clubs (HE)
      Health education (MeSH)
      Health education needs (HE)
      Health education objectives (HE)
      Health education standards (HE)
      Health educator patient relations (HE)
      Health educators (MeSH) (HE)
      Health facilities (MeSH)
      Health fairs (MeSH) (HE)
      Health field concept (HE)
      Health informatics
      Health literacy (HE)
      Health knowledge, attitudes, practice (MeSH)
      Health messages (HE)
      Health occupations (HE)
      Health officers (HE)
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      Health promotion (MeSH) (HE)
      Health resorts (MeSH)
      Health risk appraisal (HE)
      Health status (MeSH)
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Preventive medicine
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behaviour patterns detrimental
to health)
Problem solving
Public health
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Risk reduction behaviour
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Risk-taking (MeSH)
Self-care (MeSH)
Stages of change (HE)
Values clarification (HE)
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HEALTH CARE DELIVERY (HE)
BT   Health
RT   American Public Health
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      Behaviour modification (HE)
      Choice behaviour (MeSH)
      Chronic diseases and
      disorders (HE)
      Consumer health education
      Consumer health education
      programmess
      Family health (MeSH)
      Health attitude/Attitude to
      health (MeSH)
      Health behaviour (MeSH) (HE)
      Health beliefs (HE)
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Preventive health services
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Preventive medicine
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behaviour patterns detrimental
to health)
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Risk-taking (MeSH)
Self-care (MeSH)
Stages of change (HE)

Values clarification (HE)
Value systems (HE)

HEALTH CARE FACILITIES (HE)
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RT   American Public Health
Association (MeSH)
Behaviour change (HE)
Behaviour modification (HE)
Choice behaviour (MeSH)
Chronic diseases and
disorders (HE)
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Family health (MeSH)
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Holistic health (MeSH)
Information dissemination (HE)
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Preventive health services
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Preventive medicine
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behaviour patterns detrimental
to health)
Problem solving
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Risk-taking (MeSH)
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Stages of change (HE)
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HEALTH CARE MARKETING (HE)
BT   Health
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Association (MeSH)
Behaviour change (HE)
Behaviour modification (HE)
Choice behaviour (MeSH)
Chronic diseases and
disorders (HE)
Consumer health education
Consumer health education
programmess
Family health (MeSH)
Health attitude/Attitude to
health (MeSH)
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behaviour patterns detrimental
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Self-care (MeSH)
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HEALTH CARE SERVICES (HE)
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        Behaviour modification (HE)
        Choice behaviour (MeSH)
        Chronic diseases and
        disorders (HE)
        Consumer health education
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HEALTH CLUBS (HE)
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RT   American Public Health
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      Choice behaviour (MeSH)
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to health)
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Self-care (MeSH)
Stages of change (HE)
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HEALTH EDUCATION (MESH)
BT   Health
RT   American Public Health
Association (MeSH)
Behaviour change (HE)
Behaviour modification (HE)
Choice behaviour (MeSH)
Chronic diseases and
disorders (HE)
Consumer health education
Consumer health education
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Family health (MeSH)
Health attitude/Attitude to
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HEALTH EDUCATION NEEDS (HE)
BT   Health
RT   American Public Health
Association (MeSH)
Behaviour change (HE)
Behaviour modification (HE)
Choice behaviour (MeSH)
Chronic diseases and
disorders (HE)
Consumer health education
Consumer health education
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Family health (MeSH)
Health attitude/Attitude to
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Preventive health services
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to health)
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Risk reduction behaviour
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**HEALTH EDUCATION OBJECTIVES
(HE)**
BT   Health
RT   American Public Health
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       Behaviour modification (HE)
       Choice behaviour (MeSH)
       Chronic diseases and
       disorders (HE)
       Consumer health education
       Consumer health education
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       Family health (MeSH)
       Health attitude/Attitude to
       health (MeSH)
       Health behaviour (MeSH) (HE)
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       Health educators (MeSH) (HE)
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       Health literacy (HE)
       Health knowledge, attitudes,
       practice (MeSH)
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Health resorts (MeSH)
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Self-care (MeSH)
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HEALTH EDUCATION STANDARDS (HE)
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      Behaviour modification (HE)
      Choice behaviour (MeSH)
      Chronic diseases and
      disorders (HE)
      Consumer health education
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      Family health (MeSH)
      Health attitude/Attitude to
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Self-care (MeSH)
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HEALTH EDUCATOR PATIENT RELATIONS (HE)
BT   Health
RT   American Public Health Association (MeSH)
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       Behaviour modification (HE)
       Choice behaviour (MeSH)
       Chronic diseases and disorders (HE)
       Consumer health education
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Values clarification (HE)
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HEALTH EDUCATORS (MESH) (HE)
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RT   American Public Health Association (MeSH)
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       Choice behaviour (MeSH)
       Chronic diseases and disorders (HE)
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      Chronic diseases and
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      Consumer health education
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      Family health (MeSH)
      Health attitude/Attitude to
      health (MeSH)
      Health behaviour (MeSH) (HE)
      Health beliefs (HE)

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Health occupations (HE)
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Needs assessment (MeSH)
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Organisations (MeSH)
Philosophy (HE)
Preventive health services
(MeSH)
Preventive medicine
Primary prevention (SN altering
behaviour patterns detrimental
to health)

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Risk reduction behaviour
(MeSH)
Risk-taking (MeSH)
Self-care (MeSH)
Stages of change (HE)
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HEALTH FIELD CONCEPT (HE)
BT   Health
RT   American Public Health
      Association (MeSH)
      Behaviour change (HE)
      Behaviour modification (HE)
      Choice behaviour (MeSH)
      Chronic diseases and
      disorders (HE)
      Consumer health education
      Consumer health education
      programmess
      Family health (MeSH)
      Health attitude/Attitude to
      health (MeSH)
      Health behaviour (MeSH) (HE)
      Health beliefs (HE)
      Health care delivery (HE)
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      relations (HE)
      Health educators (MeSH) (HE)
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      Health literacy (HE)
      Health knowledge, attitudes,
      practice (MeSH)
      Health messages (HE)
      Health occupations (HE)
      Health officers (HE)
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      Health planning (HE)

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Preventive medicine
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Risk-taking (MeSH)
Self-care (MeSH)
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HEALTH INFORMATICS
BT   Health
RT   American Public Health
      Association (MeSH)
      Behaviour change (HE)
      Behaviour modification (HE)
      Choice behaviour (MeSH)
      Chronic diseases and
      disorders (HE)
      Consumer health education
      Consumer health education
      programmess
      Family health (MeSH)
      Health attitude/Attitude to
      health (MeSH)
      Health behaviour (MeSH) (HE)

Health beliefs (HE)
Health care delivery (HE)
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Health educator patient
relations (HE)
Health educators (MeSH) (HE)
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Health field concept (HE)
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Health knowledge, attitudes,
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Health messages (HE)
Health occupations (HE)
Health officers (HE)
Health personnel (HE)
Health plan implementation
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Health priorities (MeSH)
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Health resorts (MeSH)
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Needs assessment (MeSH)
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Philosophy (HE)
Preventive health services
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Preventive medicine

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(MeSH)
Risk-taking (MeSH)
Self-care (MeSH)
Stages of change (HE)
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Value systems (HE)

HEALTH LITERACY (HE)
BT   Health
RT   American Public Health
      Association (MeSH)
      Behaviour change (HE)
      Behaviour modification (HE)
      Choice behaviour (MeSH)
      Chronic diseases and
      disorders (HE)
      Consumer health education
      Consumer health education
      programmess
      Family health (MeSH)
      Health attitude/Attitude to
      health (MeSH)
      Health behaviour (MeSH) (HE)
      Health beliefs (HE)
      Health care delivery (HE)
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      Health care marketing (HE)
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      Health education (MeSH)
      Health education needs (HE)
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      Health educator patient
      relations (HE)
      Health educators (MeSH) (HE)
      Health facilities (MeSH)
      Health fairs (MeSH) (HE)
      Health field concept (HE)
      Health informatics
      Health knowledge, attitudes,
      practice (MeSH)
      Health messages (HE)
      Health occupations (HE)
      Health officers (HE)
      Health personnel (HE)

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(MeSH)
Health planning (HE)
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Health professionals (HE)
Health promotion (MeSH) (HE)
Health resorts (MeSH)
Health risk appraisal (HE)
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Healthy people programmess
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Holistic health (MeSH)
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Internet (HE)
Needs assessment (MeSH)
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Organisations (MeSH)
Philosophy (HE)
Preventive health services
(MeSH)
Preventive medicine
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to health)
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Value systems (HE)

**HEALTH KNOWLEDGE,
ATTITUDES, PRACTICE (MESH)**
BT   Health
RT   American Public Health
      Association (MeSH)
      Behaviour change (HE)
      Behaviour modification (HE)
      Choice behaviour (MeSH)
      Chronic diseases and
      disorders (HE)
      Consumer health education
      Consumer health education
      programmess

Family health (MeSH)
Health attitude/Attitude to
health (MeSH)
Health behaviour (MeSH) (HE)
Health beliefs (HE)
Health care delivery (HE)
Health care facilities (HE)
Health care marketing (HE)
Health care services (HE)
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Health educator patient
relations (HE)
Health educators (MeSH) (HE)
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Health fairs (MeSH) (HE)
Health field concept (HE)
Health informatics
Health literacy (HE)
Health messages (HE)
Health occupations (HE)
Health officers (HE)
Health personnel (HE)
Health plan implementation
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Health promotion (MeSH) (HE)
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Healthy people programmess
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HEALTH MESSAGES (HE)
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RT   American Public Health
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         Behaviour change (HE)
         Behaviour modification (HE)
         Choice behaviour (MeSH)
         Chronic diseases and
         disorders (HE)
         Consumer health education
         Consumer health education
         programmess
         Family health (MeSH)
         Health attitude/Attitude to
         health (MeSH)
         Health behaviour (MeSH) (HE)
         Health beliefs (HE)
         Health care delivery (HE)
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         Health care marketing (HE)
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         Health education needs (HE)
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         relations (HE)
         Health educators (MeSH) (HE)
         Health facilities (MeSH)
         Health fairs (MeSH) (HE)
         Health field concept (HE)
         Health informatics
         Health literacy (HE)
         Health knowledge, attitudes,
         practice (MeSH)
         Health occupations (HE)
         Health officers (HE)

Health personnel (HE)
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to health)
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(MeSH)
Risk-taking (MeSH)
Self-care (MeSH)
Stages of change (HE)
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Value systems (HE)

HEALTH OCCUPATIONS (HE)
BT   Health
RT   American Public Health
         Association (MeSH)
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         Behaviour modification (HE)
         Choice behaviour (MeSH)
         Chronic diseases and
         disorders (HE)
         Consumer health education
         Consumer health education
         programmess

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Family health (MeSH)
Health attitude/Attitude to health (MeSH)
Health behaviour (MeSH) (HE)
Health beliefs (HE)
Health care delivery (HE)
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Health educator patient relations (HE)
Health educators (MeSH) (HE)
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Health fairs (MeSH) (HE)
Health field concept (HE)
Health informatics
Health literacy (HE)
Health knowledge, attitudes, practice (MeSH)
Health messages (HE)
Health officers (HE)
Health personnel (HE)
Health plan implementation (MeSH)
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Self-care (MeSH)
Stages of change (HE)
Values clarification (HE)
Value systems (HE)

HEALTH OFFICERS (HE)
BT   Health
RT   American Public Health Association (MeSH)
      Behaviour change (HE)
      Behaviour modification (HE)
      Choice behaviour (MeSH)
      Chronic diseases and disorders (HE)
      Consumer health education
      Consumer health education programmess
      Family health (MeSH)
      Health attitude/Attitude to health (MeSH)
      Health behaviour (MeSH) (HE)
      Health beliefs (HE)
      Health care delivery (HE)
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      Health educator patient relations (HE)
      Health educators (MeSH) (HE)
      Health facilities (MeSH)
      Health fairs (MeSH) (HE)
      Health field concept (HE)
      Health informatics
      Health literacy (HE)
      Health knowledge, attitudes, practice (MeSH)

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Health messages (HE)
Health occupations (HE)
Health personnel (HE)
Health plan implementation (MeSH)
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Health professionals (HE)
Health promotion (MeSH) (HE)
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Preventive health services (MeSH)
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Risk-taking (MeSH)
Self-care (MeSH)
Stages of change (HE)
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Value systems (HE)

HEALTH PERSONNEL (HE)
BT   Health
RT   American Public Health Association (MeSH)
     Behaviour change (HE)
     Behaviour modification (HE)
     Choice behaviour (MeSH)
     Chronic diseases and disorders (HE)
     Consumer health education

Consumer health education programmess
Family health (MeSH)
Health attitude/Attitude to health (MeSH)
Health behaviour (MeSH) (HE)
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Self-care (MeSH)
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Values clarification (HE)
Value systems (HE)

HEALTH PLAN IMPLEMENTATION (MESH)
BT   Health
RT   American Public Health Association (MeSH)
        Behaviour change (HE)
        Behaviour modification (HE)
        Choice behaviour (MeSH)
        Chronic diseases and disorders (HE)
        Consumer health education
        Consumer health education programmess
        Family health (MeSH)
        Health attitude/Attitude to health (MeSH)
        Health behaviour (MeSH) (HE)
        Health beliefs (HE)
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        Health field concept (HE)
        Health informatics
        Health literacy (HE)

Health knowledge, attitudes, practice (MeSH)
Health messages (HE)
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Stages of change (HE)
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HEALTH PLANNING (HE)
BT   Health
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        Behaviour modification (HE)
        Choice behaviour (MeSH)
        Chronic diseases and disorders (HE)

Consumer health education
Consumer health education programmess
Family health (MeSH)
Health attitude/Attitude to health (MeSH)
Health behaviour (MeSH) (HE)
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Health educators (MeSH) (HE)
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Self-care (MeSH)
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HEALTH PRIORITIES (MESH)
BT   Health
RT   American Public Health Association (MeSH)
      Behaviour change (HE)
      Behaviour modification (HE)
      Choice behaviour (MeSH)
      Chronic diseases and disorders (HE)
      Consumer health education
      Consumer health education programmess
      Family health (MeSH)
      Health attitude/Attitude to health (MeSH)
      Health behaviour (MeSH) (HE)
      Health beliefs (HE)
      Health care delivery (HE)
      Health care facilities (HE)
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      Health education (MeSH)
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      Health educator patient relations (HE)
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      Health facilities (MeSH)
      Health fairs (MeSH) (HE)
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Health knowledge, attitudes, practice (MeSH)
Health messages (HE)
Health occupations (HE)
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HEALTH PROFESSIONALS (HE)
BT   Health
RT   American Public Health Association (MeSH)
      Behaviour change (HE)
      Behaviour modification (HE)
      Choice behaviour (MeSH)

Chronic diseases and disorders (HE)
Consumer health education
Consumer health education programmess
Family health (MeSH)
Health attitude/Attitude to health (MeSH)
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Health beliefs (HE)
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Health care facilities (HE)
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Self-care (MeSH)
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HEALTH PROMOTION (MESH) (HE)
BT   Health
RT   American Public Health
      Association (MeSH)
      Behaviour change (HE)
      Behaviour modification (HE)
      Choice behaviour (MeSH)
      Chronic diseases and
      disorders (HE)
      Consumer health education
      Consumer health education
      programmess
      Family health (MeSH)
      Health attitude/Attitude to
      health (MeSH)
      Health behaviour (MeSH) (HE)
      Health beliefs (HE)
      Health care delivery (HE)
      Health care facilities (HE)
      Health care marketing (HE)
      Health care services (HE)
      Health clubs (HE)
      Health education (MeSH)
      Health education needs (HE)
      Health education objectives
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      Health education standards
      (HE)
      Health educator patient
      relations (HE)
      Health educators (MeSH) (HE)
      Health facilities (MeSH)
      Health fairs (MeSH) (HE)
      Health field concept (HE)

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Health literacy (HE)
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HEALTH RESORTS (MESH)
BT   Health
RT   American Public Health
      Association (MeSH)
      Behaviour change (HE)
      Behaviour modification (HE)

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Consumer health education
Consumer health education
programmess
Family health (MeSH)
Health attitude/Attitude to
health (MeSH)
Health behaviour (MeSH) (HE)
Health beliefs (HE)
Health care delivery (HE)
Health care facilities (HE)
Health care marketing (HE)
Health care services (HE)
Health clubs (HE)
Health education (MeSH)
Health education needs (HE)
Health education objectives
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Health education standards
(HE)
Health educator patient
relations (HE)
Health educators (MeSH) (HE)
Health facilities (MeSH)
Health fairs (MeSH) (HE)
Health field concept (HE)
Health informatics
Health literacy (HE)
Health knowledge, attitudes,
practice (MeSH)
Health messages (HE)
Health occupations (HE)
Health officers (HE)
Health personnel (HE)
Health plan implementation
(MeSH)
Health planning (HE)
Health priorities (MeSH)
Health professionals (HE)
Health promotion (MeSH) (HE)
Health risk appraisal (HE)
Health status (MeSH)
Health status indicators
(MeSH)
Health surveys (MeSH)
Health systems agencies (HE)
Health values (HE)
Health visitors (HE)
Healthy people 2010 (HE)
Healthy people programmess
(MeSH)
Holistic health (MeSH)
Information dissemination (HE)

Internet (HE)
Needs assessment (MeSH)
(HE)
Organisations (MeSH)
Philosophy (HE)
Preventive health services
(MeSH)
Preventive medicine
Primary prevention (SN altering
behaviour patterns detrimental
to health)
Problem solving
Public health
Quality of life
Risk reduction behaviour
(MeSH)
Risk-taking (MeSH)
Self-care (MeSH)
Stages of change (HE)
Values clarification (HE)
Value systems (HE)

HEALTH RISK APPRAISAL (HE)
BT   Health
RT   American Public Health
       Association (MeSH)
       Behaviour change (HE)
       Behaviour modification (HE)
       Choice behaviour (MeSH)
       Chronic diseases and
       disorders (HE)
       Consumer health education
       Consumer health education
       programmess
       Family health (MeSH)
       Health attitude/Attitude to
       health (MeSH)
       Health behaviour (MeSH) (HE)
       Health beliefs (HE)
       Health care delivery (HE)
       Health care facilities (HE)
       Health care marketing (HE)
       Health care services (HE)
       Health clubs (HE)
       Health education (MeSH)
       Health education needs (HE)
       Health education objectives
       (HE)
       Health education standards
       (HE)
       Health educator patient
       relations (HE)
       Health educators (MeSH) (HE)
       Health facilities (MeSH)
       Health fairs (MeSH) (HE)

Health field concept (HE)
Health informatics
Health literacy (HE)
Health knowledge, attitudes, practice (MeSH)
Health messages (HE)
Health occupations (HE)
Health officers (HE)
Health personnel (HE)
Health plan implementation (MeSH)
Health planning (HE)
Health priorities (MeSH)
Health professionals (HE)
Health promotion (MeSH) (HE)
Health resorts (MeSH)
Health status (MeSH)
Health status indicators (MeSH)
Health surveys (MeSH)
Health systems agencies (HE)
Health values (HE)
Health visitors (HE)
Healthy people 2010 (HE)
Healthy people programmess (MeSH)
Holistic health (MeSH)
Information dissemination (HE)
Internet (HE)
Needs assessment (MeSH) (HE)
Organisations (MeSH)
Philosophy (HE)
Preventive health services (MeSH)
Preventive medicine
Primary prevention (SN altering behaviour patterns detrimental to health)
Problem solving
Public health
Quality of life
Risk reduction behaviour (MeSH)
Risk-taking (MeSH)
Self-care (MeSH)
Stages of change (HE)
Values clarification (HE)
Value systems (HE)

HEALTH STATUS (MESH)
BT   Health
RT   American Public Health Association (MeSH)
      Behaviour change (HE)

Behaviour modification (HE)
Choice behaviour (MeSH)
Chronic diseases and disorders (HE)
Consumer health education
Consumer health education programmess
Family health (MeSH)
Health attitude/Attitude to health (MeSH)
Health behaviour (MeSH) (HE)
Health beliefs (HE)
Health care delivery (HE)
Health care facilities (HE)
Health care marketing (HE)
Health care services (HE)
Health clubs (HE)
Health education (MeSH)
Health education needs (HE)
Health education objectives (HE)
Health education standards (HE)
Health educator patient relations (HE)
Health educators (MeSH) (HE)
Health facilities (MeSH)
Health fairs (MeSH) (HE)
Health field concept (HE)
Health informatics
Health literacy (HE)
Health knowledge, attitudes, practice (MeSH)
Health messages (HE)
Health occupations (HE)
Health officers (HE)
Health personnel (HE)
Health plan implementation (MeSH)
Health planning (HE)
Health priorities (MeSH)
Health professionals (HE)
Health promotion (MeSH) (HE)
Health resorts (MeSH)
Health risk appraisal (HE)
Health status indicators (MeSH)
Health surveys (MeSH)
Health systems agencies (HE)
Health values (HE)
Health visitors (HE)
Healthy people 2010 (HE)
Healthy people programmess (MeSH)
Holistic health (MeSH)

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Information dissemination (HE)
Internet (HE)
Needs assessment (MeSH)
(HE)
Organisations (MeSH)
Philosophy (HE)
Preventive health services
(MeSH)
Preventive medicine
Primary prevention (SN altering
behaviour patterns detrimental
to health)
Problem solving
Public health
Quality of life
Risk reduction behaviour
(MeSH)
Risk-taking (MeSH)
Self-care (MeSH)
Stages of change (HE)
Values clarification (HE)
Value systems (HE)

**HEALTH STATUS INDICATORS
(MESH)**
BT   Health
RT   American Public Health
       Association (MeSH)
       Behaviour change (HE)
       Behaviour modification (HE)
       Choice behaviour (MeSH)
       Chronic diseases and
       disorders (HE)
       Consumer health education
       Consumer health education
       programmess
       Family health (MeSH)
       Health attitude/Attitude to
       health (MeSH)
       Health behaviour (MeSH) (HE)
       Health beliefs (HE)
       Health care delivery (HE)
       Health care facilities (HE)
       Health care marketing (HE)
       Health care services (HE)
       Health clubs (HE)
       Health education (MeSH)
       Health education needs (HE)
       Health education objectives
       (HE)
       Health education standards
       (HE)
       Health educator patient
       relations (HE)
       Health educators (MeSH) (HE)

Health facilities (MeSH)
Health fairs (MeSH) (HE)
Health field concept (HE)
Health informatics
Health literacy (HE)
Health knowledge, attitudes,
practice (MeSH)
Health messages (HE)
Health occupations (HE)
Health officers (HE)
Health personnel (HE)
Health plan implementation
(MeSH)
Health planning (HE)
Health priorities (MeSH)
Health professionals (HE)
Health promotion (MeSH) (HE)
Health resorts (MeSH)
Health risk appraisal (HE)
Health status (MeSH)
Health surveys (MeSH)
Health systems agencies (HE)
Health values (HE)
Health visitors (HE)
Healthy people 2010 (HE)
Healthy people programmess
(MeSH)
Holistic health (MeSH)
Information dissemination (HE)
Internet (HE)
Needs assessment (MeSH)
(HE)
Organisations (MeSH)
Philosophy (HE)
Preventive health services
(MeSH)
Preventive medicine
Primary prevention (SN altering
behaviour patterns detrimental
to health)
Problem solving
Public health
Quality of life
Risk reduction behaviour
(MeSH)
Risk-taking (MeSH)
Self-care (MeSH)
Stages of change (HE)
Values clarification (HE)
Value systems (HE)

HEALTH SURVEYS (MESH)
BT   Health
RT   American Public Health
       Association (MeSH)

Behaviour change (HE)
Behaviour modification (HE)
Choice behaviour (MeSH)
Chronic diseases and
disorders (HE)
Consumer health education
Consumer health education
programmess
Family health (MeSH)
Health attitude/Attitude to
health (MeSH)
Health behaviour (MeSH) (HE)
Health beliefs (HE)
Health care delivery (HE)
Health care facilities (HE)
Health care marketing (HE)
Health care services (HE)
Health clubs (HE)
Health education (MeSH)
Health education needs (HE)
Health education objectives
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Health education standards
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Health educator patient
relations (HE)
Health educators (MeSH) (HE)
Health facilities (MeSH)
Health fairs (MeSH) (HE)
Health field concept (HE)
Health informatics
Health literacy (HE)
Health knowledge, attitudes,
practice (MeSH)
Health messages (HE)
Health occupations (HE)
Health officers (HE)
Health personnel (HE)
Health plan implementation
(MeSH)
Health planning (HE)
Health priorities (MeSH)
Health professionals (HE)
Health promotion (MeSH) (HE)
Health resorts (MeSH)
Health risk appraisal (HE)
Health status (MeSH)
Health status indicators
(MeSH)
Health systems agencies (HE)
Health values (HE)
Health visitors (HE)
Healthy people 2010 (HE)
Healthy people programmess
(MeSH)

Holistic health (MeSH)
Information dissemination (HE)
Internet (HE)
Needs assessment (MeSH)
(HE)
Organisations (MeSH)
Philosophy (HE)
Preventive health services
(MeSH)
Preventive medicine
Primary prevention (SN altering
behaviour patterns detrimental
to health)
Problem solving
Public health
Quality of life
Risk reduction behaviour
(MeSH)
Risk-taking (MeSH)
Self-care (MeSH)
Stages of change (HE)
Values clarification (HE)
Value systems (HE)

HEALTH SYSTEMS AGENCIES (HE)
BT   Health
RT   American Public Health
       Association (MeSH)
       Behaviour change (HE)
       Behaviour modification (HE)
       Choice behaviour (MeSH)
       Chronic diseases and
       disorders (HE)
       Consumer health education
       Consumer health education
       programmess
       Family health (MeSH)
       Health attitude/Attitude to
       health (MeSH)
       Health behaviour (MeSH) (HE)
       Health beliefs (HE)
       Health care delivery (HE)
       Health care facilities (HE)
       Health care marketing (HE)
       Health care services (HE)
       Health clubs (HE)
       Health education (MeSH)
       Health education needs (HE)
       Health education objectives
       (HE)
       Health education standards
       (HE)
       Health educator patient
       relations (HE)
       Health educators (MeSH) (HE)

Health facilities (MeSH)
Health fairs (MeSH) (HE)
Health field concept (HE)
Health informatics
Health literacy (HE)
Health knowledge, attitudes, practice (MeSH)
Health messages (HE)
Health occupations (HE)
Health officers (HE)
Health personnel (HE)
Health plan implementation (MeSH)
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Health priorities (MeSH)
Health professionals (HE)
Health promotion (MeSH) (HE)
Health resorts (MeSH)
Health risk appraisal (HE)
Health status (MeSH)
Health status indicators (MeSH)
Health surveys (MeSH)
Health values (HE)
Health visitors (HE)
Healthy people 2010 (HE)
Healthy people programmess (MeSH)
Holistic health (MeSH)
Information dissemination (HE)
Internet (HE)
Needs assessment (MeSH) (HE)
Organisations (MeSH)
Philosophy (HE)
Preventive health services (MeSH)
Preventive medicine
Primary prevention (SN altering behaviour patterns detrimental to health)
Problem solving
Public health
Quality of life
Risk reduction behaviour (MeSH)
Risk-taking (MeSH)
Self-care (MeSH)
Stages of change (HE)
Values clarification (HE)
Value systems (HE)

HEALTH VALUES (HE)
BT   Health

RT   American Public Health Association (MeSH)
Behaviour change (HE)
Behaviour modification (HE)
Choice behaviour (MeSH)
Chronic diseases and disorders (HE)
Consumer health education
Consumer health education programmess
Family health (MeSH)
Health attitude/Attitude to health (MeSH)
Health behaviour (MeSH) (HE)
Health beliefs (HE)
Health care delivery (HE)
Health care facilities (HE)
Health care marketing (HE)
Health care services (HE)
Health clubs (HE)
Health education (MeSH)
Health education needs (HE)
Health education objectives (HE)
Health education standards (HE)
Health educator patient relations (HE)
Health educators (MeSH) (HE)
Health facilities (MeSH)
Health fairs (MeSH) (HE)
Health field concept (HE)
Health informatics
Health literacy (HE)
Health knowledge, attitudes, practice (MeSH)
Health messages (HE)
Health occupations (HE)
Health officers (HE)
Health personnel (HE)
Health plan implementation (MeSH)
Health planning (HE)
Health priorities (MeSH)
Health professionals (HE)
Health promotion (MeSH) (HE)
Health resorts (MeSH)
Health risk appraisal (HE)
Health status (MeSH)
Health status indicators (MeSH)
Health surveys (MeSH)
Health systems agencies (HE)
Health visitors (HE)
Healthy people 2010 (HE)

Healthy people programmess (MeSH)
Holistic health (MeSH)
Information dissemination (HE)
Internet (HE)
Needs assessment (MeSH) (HE)
Organisations (MeSH)
Philosophy (HE)
Preventive health services (MeSH)
Preventive medicine
Primary prevention (SN altering behaviour patterns detrimental to health)
Problem solving
Public health
Quality of life
Risk reduction behaviour (MeSH)
Risk-taking (MeSH)
Self-care (MeSH)
Stages of change (HE)
Values clarification (HE)
Value systems (HE)

HEALTH VISITORS (HE)
BT   Health
RT   American Public Health Association (MeSH)
      Behaviour change (HE)
      Behaviour modification (HE)
      Choice behaviour (MeSH)
      Chronic diseases and disorders (HE)
      Consumer health education
      Consumer health education programmess
      Family health (MeSH)
      Health attitude/Attitude to health (MeSH)
      Health behaviour (MeSH) (HE)
      Health beliefs (HE)
      Health care delivery (HE)
      Health care facilities (HE)
      Health care marketing (HE)
      Health care services (HE)
      Health clubs (HE)
      Health education (MeSH)
      Health education needs (HE)
      Health education objectives (HE)
      Health education standards (HE)

Health educator patient relations (HE)
Health educators (MeSH) (HE)
Health facilities (MeSH)
Health fairs (MeSH) (HE)
Health field concept (HE)
Health informatics
Health literacy (HE)
Health knowledge, attitudes, practice (MeSH)
Health messages (HE)
Health occupations (HE)
Health officers (HE)
Health personnel (HE)
Health plan implementation (MeSH)
Health planning (HE)
Health priorities (MeSH)
Health professionals (HE)
Health promotion (MeSH) (HE)
Health resorts (MeSH)
Health risk appraisal (HE)
Health status (MeSH)
Health status indicators (MeSH)
Health surveys (MeSH)
Health systems agencies (HE)
Health values (HE)
Healthy people 2010 (HE)
Healthy people programmess (MeSH)
Holistic health (MeSH)
Information dissemination (HE)
Internet (HE)
Needs assessment (MeSH) (HE)
Organisations (MeSH)
Philosophy (HE)
Preventive health services (MeSH)
Preventive medicine
Primary prevention (SN altering behaviour patterns detrimental to health)
Problem solving
Public health
Quality of life
Risk reduction behaviour (MeSH)
Risk-taking (MeSH)
Self-care (MeSH)
Stages of change (HE)
Values clarification (HE)
Value systems (HE)

HEALTHY PEOPLE 2010 (HE)
BT   Health
RT   American Public Health
      Association (MeSH)
      Behaviour change (HE)
      Behaviour modification (HE)
      Choice behaviour (MeSH)
      Chronic diseases and
      disorders (HE)
      Consumer health education
      Consumer health education
      programmess
      Family health (MeSH)
      Health attitude/Attitude to
      health (MeSH)
      Health behaviour (MeSH) (HE)
      Health beliefs (HE)
      Health care delivery (HE)
      Health care facilities (HE)
      Health care marketing (HE)
      Health care services (HE)
      Health clubs (HE)
      Health education (MeSH)
      Health education needs (HE)
      Health education objectives
      (HE)
      Health education standards
      (HE)
      Health educator patient
      relations (HE)
      Health educators (MeSH) (HE)
      Health facilities (MeSH)
      Health fairs (MeSH) (HE)
      Health field concept (HE)
      Health informatics
      Health literacy (HE)
      Health knowledge, attitudes,
      practice (MeSH)
      Health messages (HE)
      Health occupations (HE)
      Health officers (HE)
      Health personnel (HE)
      Health plan implementation
      (MeSH)
      Health planning (HE)
      Health priorities (MeSH)
      Health professionals (HE)
      Health promotion (MeSH) (HE)
      Health resorts (MeSH)
      Health risk appraisal (HE)
      Health status (MeSH)
      Health status indicators
      (MeSH)
      Health surveys (MeSH)
      Health systems agencies (HE)

      Health values (HE)
      Health visitors (HE)
      Healthy people programmess
      (MeSH)
      Holistic health (MeSH)
      Information dissemination (HE)
      Internet (HE)
      Needs assessment (MeSH)
      (HE)
      Organisations (MeSH)
      Philosophy (HE)
      Preventive health services
      (MeSH)
      Preventive medicine
      Primary prevention (SN altering
      behaviour patterns detrimental
      to health)
      Problem solving
      Public health
      Quality of life
      Risk reduction behaviour
      (MeSH)
      Risk-taking (MeSH)
      Self-care (MeSH)
      Stages of change (HE)
      Values clarification (HE)
      Value systems (HE)

**HEALTHY PEOPLE
PROGRAMMESS (MESH)**
BT   Health
RT   American Public Health
      Association (MeSH)
      Behaviour change (HE)
      Behaviour modification (HE)
      Choice behaviour (MeSH)
      Chronic diseases and
      disorders (HE)
      Consumer health education
      Consumer health education
      programmess
      Family health (MeSH)
      Health attitude/Attitude to
      health (MeSH)
      Health behaviour (MeSH) (HE)
      Health beliefs (HE)
      Health care delivery (HE)
      Health care facilities (HE)
      Health care marketing (HE)
      Health care services (HE)
      Health clubs (HE)
      Health education (MeSH)
      Health education needs (HE)
      Health education objectives
      (HE)

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Health education standards
(HE)
Health educator patient
relations (HE)
Health educators (MeSH) (HE)
Health facilities (MeSH)
Health fairs (MeSH) (HE)
Health field concept (HE)
Health informatics
Health literacy (HE)
Health knowledge, attitudes,
practice (MeSH)
Health messages (HE)
Health occupations (HE)
Health officers (HE)
Health personnel (HE)
Health plan implementation
(MeSH)
Health planning (HE)
Health priorities (MeSH)
Health professionals (HE)
Health promotion (MeSH) (HE)
Health resorts (MeSH)
Health risk appraisal (HE)
Health status (MeSH)
Health status indicators
(MeSH)
Health surveys (MeSH)
Health systems agencies (HE)
Health values (HE)
Health visitors (HE)
Healthy people 2010 (HE)
Holistic health (MeSH)
Information dissemination (HE)
Internet (HE)
Needs assessment (MeSH)
(HE)
Organisations (MeSH)
Philosophy (HE)
Preventive health services
(MeSH)
Preventive medicine
Primary prevention (SN altering
behaviour patterns detrimental
to health)
Problem solving
Public health
Quality of life
Risk reduction behaviour
(MeSH)
Risk-taking (MeSH)
Self-care (MeSH)
Stages of change (HE)
Values clarification (HE)
Value systems (HE)

HOLISTIC HEALTH (MESH)
BT   Health
RT   American Public Health
        Association (MeSH)
        Behaviour change (HE)
        Behaviour modification (HE)
        Choice behaviour (MeSH)
        Chronic diseases and
        disorders (HE)
        Consumer health education
        Consumer health education
        programmess
        Family health (MeSH)
        Health attitude/Attitude to
        health (MeSH)
        Health behaviour (MeSH) (HE)
        Health beliefs (HE)
        Health care delivery (HE)
        Health care facilities (HE)
        Health care marketing (HE)
        Health care services (HE)
        Health clubs (HE)
        Health education (MeSH)
        Health education needs (HE)
        Health education objectives
        (HE)
        Health education standards
        (HE)
        Health educator patient
        relations (HE)
        Health educators (MeSH) (HE)
        Health facilities (MeSH)
        Health fairs (MeSH) (HE)
        Health field concept (HE)
        Health informatics
        Health literacy (HE)
        Health knowledge, attitudes,
        practice (MeSH)
        Health messages (HE)
        Health occupations (HE)
        Health officers (HE)
        Health personnel (HE)
        Health plan implementation
        (MeSH)
        Health planning (HE)
        Health priorities (MeSH)
        Health professionals (HE)
        Health promotion (MeSH) (HE)
        Health resorts (MeSH)
        Health risk appraisal (HE)
        Health status (MeSH)
        Health status indicators
        (MeSH)
        Health surveys (MeSH)

Health systems agencies (HE)
Health values (HE)
Health visitors (HE)
Healthy people 2010 (HE)
Healthy people programmess
(MeSH)
Information dissemination (HE)
Internet (HE)
Needs assessment (MeSH)
(HE)
Organisations (MeSH)
Philosophy (HE)
Preventive health services
(MeSH)
Preventive medicine
Primary prevention (SN altering
behaviour patterns detrimental
to health)
Problem solving
Public health
Quality of life
Risk reduction behaviour
(MeSH)
Risk-taking (MeSH)
Self-care (MeSH)
Stages of change (HE)
Values clarification (HE)
Value systems (HE)

HEALTH PROMOTION (HE)
BT   Wellness
RT   Ecological perspective
        Holistic approach
        Morbidity

HOLISTIC APPROACH (HE)
BT   Wellness
RT   Ecological perspective
        Health promotion
        Morbidity

HUMAN SEXUALITY (HE)
BT   Life in balance
        Lifestyle
RT   Abstinence
        Addiction
        Adjustment
        Alcohol use
        Attitude change
        Attitudes
        Cardiovascular risk factors
        (HE)
        Coping (HE)
        Decision-making
        Depression (HE)

Drug use
Empowerment (HE)
Health behaviour
Independent living
Laughter (MeSH)
Laughter therapy (MeSH)
Mental illness (HE)
Psychological factors
Psychosocial factors (HE)
Quality of life
Risk factor intervention
Self efficacy (HE)
Sex behaviour
Temperance (MeSH)
Tobacco use
Wit and humor (MeSH)

HUSBANDS
BT   Loving relationships
RT   Attitude change (HE)
        Attitudes (HE)
        Child care
        Children (HE)
        Christianity (HE)
        Communication problems (HE)
        Communication skills (HE)
        Coping (HE)
        Divorce (HE)
        Families (HE)
        Interpersonal skills (HE)
        Listening skills (HE)
        Marital status
        Mother child relations
        Parent child relations
        Parent responsibility
        Persuasion (HE)
        Psychological factors (HE)
        Psychosocial factors (HE)
        Religion (HE)
        Self concept (HE)
        Self efficacy (HE)
        Single parent families (HE)
        Wives

HYDRATION
BT   Water
RT   Baths (MeSH)
        Dehydration (MeSH)
        Drinking (MeSH)
        Drinking behaviour (MeSH)
        Hydrotherapy (MeSH)
        Thirst (MeSH)
        Water purification (MeSH)

HYDROTHERAPY

BT   Water
RT   Baths (MeSH)
       Dehydration (MeSH)
       Drinking (MeSH)
       Drinking behaviour (MeSH)
       Hydration (?)
       Thirst (MeSH)
       Water purification (MeSH)

INDEPENDENT LIVING (HE)
BT   Life in balance
       Lifestyle
RT   Abstinence
       Addiction
       Adjustment
       Alcohol use
       Attitude change
       Attitudes
       Cardiovascular risk factors
       (HE)
       Coping (HE)

       Decision-making
       Depression (HE)
       Drug use
       Empowerment (HE)
       Health behaviour
       Human sexuality
       Laughter (MeSH)
       Laughter therapy (MeSH)
       Mental illness (HE)
       Psychological factors
       Psychosocial factors (HE)
       Quality of life
       Risk factor intervention
       Self efficacy (HE)
       Sex behaviour
       Temperance (MeSH)
       Tobacco use
       Wit and humor (MeSH)

INFANT NUTRITION (HE)
BT   Nutrition
RT   Allied health personnel
       Body mass index
       Body size
       Caffeine
       Cardiovascular risk factors
       Cooking techniques
       Diet
       Dietary assessment
       Dietary guidelines
       Eating behaviour
       Eating disorders

       Food
       Fruits and vegetables (HE)
       Health behaviour
       Menus
       Nutrition education
       Nutrition education
       programmess
       Nutritionists
       Obesity
       Parenteral nutrition
       Recipes
       Recommended dietary
       allowances
       Risk factor intervention
       Weight control
       Weight control programmess

INFORMATION DISSEMINATION (HE)
BT   Health
RT   American Public Health
       Association (MeSH)
       Behaviour change (HE)
       Behaviour modification (HE)
       Choice behaviour (MeSH)
       Chronic diseases and
       disorders (HE)
       Consumer health education
       Consumer health education
       programmess
       Family health (MeSH)
       Health attitude/Attitude to
       health (MeSH)
       Health behaviour (MeSH) (HE)
       Health beliefs (HE)
       Health care delivery (HE)
       Health care facilities (HE)
       Health care marketing (HE)
       Health care services (HE)
       Health clubs (HE)
       Health education (MeSH)
       Health education needs (HE)
       Health education objectives
       (HE)
       Health education standards
       (HE)
       Health educator patient
       relations (HE)
       Health educators (MeSH) (HE)
       Health facilities (MeSH)
       Health fairs (MeSH) (HE)
       Health field concept (HE)
       Health informatics
       Health literacy (HE)

Health knowledge, attitudes, practice (MeSH)
Health messages (HE)
Health occupations (HE)
Health officers (HE)
Health personnel (HE)
Health plan implementation (MeSH)
Health planning (HE)
Health priorities (MeSH)
Health professionals (HE)
Health promotion (MeSH) (HE)
Health resorts (MeSH)
Health risk appraisal (HE)
Health status (MeSH)
Health status indicators (MeSH)
Health surveys (MeSH)
Health systems agencies (HE)
Health values (HE)
Health visitors (HE)
Healthy people 2010 (HE)
Healthy people programmess (MeSH)
Holistic health (MeSH)
Internet (HE)
Needs assessment (MeSH) (HE)
Organisations (MeSH)
Philosophy (HE)
Preventive health services (MeSH)
Preventive medicine
Primary prevention (SN altering behaviour patterns detrimental to health)
Problem solving
Public health
Quality of life
Risk reduction behaviour (MeSH)
Risk-taking (MeSH)
Self-care (MeSH)
Stages of change (HE)
Values clarification (HE)
Value systems (HE)

INTERNET (HE)
BT   Health
RT   American Public Health Association (MeSH)
      Behaviour change (HE)
      Behaviour modification (HE)
      Choice behaviour (MeSH)

Chronic diseases and disorders (HE)
Consumer health education
Consumer health education programmess
Family health (MeSH)
Health attitude/Attitude to health (MeSH)
Health behaviour (MeSH) (HE)
Health beliefs (HE)
Health care delivery (HE)
Health care facilities (HE)
Health care marketing (HE)
Health care services (HE)
Health clubs (HE)
Health education (MeSH)
Health education needs (HE)
Health education objectives (HE)
Health education standards (HE)
Health educator patient relations (HE)
Health educators (MeSH) (HE)
Health facilities (MeSH)
Health fairs (MeSH) (HE)
Health field concept (HE)
Health informatics
Health literacy (HE)
Health knowledge, attitudes, practice (MeSH)
Health messages (HE)
Health occupations (HE)
Health officers (HE)
Health personnel (HE)
Health plan implementation (MeSH)
Health planning (HE)
Health priorities (MeSH)
Health professionals (HE)
Health promotion (MeSH) (HE)
Health resorts (MeSH)
Health risk appraisal (HE)
Health status (MeSH)
Health status indicators (MeSH)
Health surveys (MeSH)
Health systems agencies (HE)
Health values (HE)
Health visitors (HE)
Healthy people 2010 (HE)
Healthy people programmess (MeSH)
Holistic health (MeSH)
Information dissemination (HE)

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Needs assessment (MeSH)
(HE)
Organisations (MeSH)
Philosophy (HE)
Preventive health services
(MeSH)
Preventive medicine
Primary prevention (SN altering
behaviour patterns detrimental
to health)
Problem solving
Public health
Quality of life
Risk reduction behaviour
(MeSH)
Risk-taking (MeSH)
Self-care (MeSH)
Stages of change (HE)
Values clarification (HE)
Value systems (HE)

INTERPERSONAL SKILLS (HE)
BT   Loving relationships
RT   Attitude change (HE)
      Attitudes (HE)
      Child care
      Children (HE)
      Christianity (HE)
      Communication problems (HE)
      Communication skills (HE)
      Coping (HE)
      Divorce (HE)
      Families (HE)
      Husbands
      Listening skills (HE)
      Marital status
      Mother child relations
      Parent child relations
      Parent responsibility
      Persuasion (HE)
      Psychological factors (HE)
      Psychosocial factors (HE)
      Religion (HE)
      Self concept (HE)
      Self efficacy (HE)
      Single parent families (HE)
      Wives

LAUGHTER (MESH)
BT   Life in balance
RT   Abstinence
      Addiction (?)
      Adjustment (HE)
      Alcohol use
      Attitude change (HE)

Cardiovascular risk factors
(HE)
Coping (HE)
Depression (HE)
Drug use
Empowerment (HE)
Health behaviour
Human sexuality
Independent living (HE)
Laughter therapy (MeSH)
Mental illness (HE)
Psychological factors (HE)
Psychosocial factors (HE)
Self efficacy (HE)
Sex behaviour
Temperance (MeSH)
Tobacco use
Wit and humor (MeSH)

LAUGHTER THERAPY (MESH)
BT   Life in balance
RT   Abstinence
      Addiction (?)
      Adjustment (HE)
      Alcohol use
      Attitude change (HE)
      Cardiovascular risk factors
      (HE)
      Coping (HE)
      Depression (HE)
      Drug use
      Empowerment (HE)
      Health behaviour
      Human sexuality
      Independent living (HE)
      Laughter (MeSH)
      Mental illness (HE)
      Psychological factors (HE)
      Psychosocial factors (HE)
      Self efficacy (HE)
      Sex behaviour
      Temperance (MeSH)
      Tobacco use
      Wit and humor (MeSH)

LIFE IN BALANCE
NT   Abstinence
      Addiction (?)
      Adjustment (HE)
      Alcohol use
      Attitude change (HE)
      Cardiovascular risk factors
      (HE)
      Coping (HE)
      Depression (HE)

Drug use
Empowerment (HE)
Health behaviour
Human sexuality
Independent living (HE)
Laughter (MeSH)
Laughter therapy (MeSH)
Lifestyle
Mental illness (HE)
Psychological factors (HE)
Psychosocial factors (HE)
Self efficacy (HE)
Sex behaviour
Temperance (MeSH)
Tobacco use
Wit and humor (MeSH)

LIFESTYLE (HE)
BT   Life in balance
NT   Adjustment
        Attitude change
        Attitudes
        Decision-making
        Health behaviour (NT)
        Human sexuality
        Independent living
        Psychological factors
        Quality of life
        Risk factor intervention

LIFESTYLE PROGRAMMESS
BT   Lifestyle

LISTENING SKILLS (HE)
BT   Loving relationships
RT   Attitude change (HE)
        Attitudes (HE)
        Child care
        Children (HE)
        Christianity (HE)
        Communication problems (HE)
        Communication skills (HE)
        Coping (HE)
        Divorce (HE)
        Families (HE)
        Husbands
        Interpersonal skills (HE)
        Marital status
        Mother child relations
        Parent child relations
        Parent responsibility
        Persuasion (HE)
        Psychological factors (HE)
        Psychosocial factors (HE)
        Religion (HE)

Self concept (HE)
Self efficacy (HE)
Single parent families (HE)
Wives

LOVING RELATIONSHIPS
NT   Attitude change (HE)
        Attitudes (HE)
        Child care
        Children (HE)
        Christianity (HE)
        Communication problems (HE)
        Communication skills (HE)
        Coping (HE)
        Divorce (HE)
        Families (HE)
        Husbands
        Interpersonal skills (HE)
        Listening skills (HE)
        Marital status
        Mother child relations
        Parent child relations
        Parent responsibility
        Persuasion (HE)
        Psychological factors (HE)
        Psychosocial factors (HE)
        Religion (HE)
        Self concept (HE)
        Self efficacy (HE)
        Single parent families (HE)
        Wives

MARITAL STATUS
BT   Loving relationships
RT   Attitude change (HE)
        Attitudes (HE)
        Child care
        Children (HE)
        Christianity (HE)
        Communication problems (HE)
        Communication skills (HE)
        Coping (HE)
        Divorce (HE)
        Families (HE)
        Husbands
        Interpersonal skills (HE)
        Listening skills (HE)
        Mother child relations
        Parent child relations
        Parent responsibility
        Persuasion (HE)
        Psychological factors (HE)
        Psychosocial factors (HE)
        Religion (HE)
        Self concept (HE)

Self efficacy (HE)
Single parent families (HE)
Wives

MENTAL ILLNESS (HE)
BT   Life in balance
RT   Abstinence
Addiction (?)
Adjustment (HE)
Alcohol use
Attitude change (HE)
Cardiovascular risk factors
(HE)
Coping (HE)
Depression (HE)
Drug use
Empowerment (HE)
Health behaviour
Human sexuality
Independent living (HE)
Laughter (MeSH)
Laughter therapy (MeSH)
Psychological factors (HE)
Psychosocial factors (HE)
Self efficacy (HE)
Sex behaviour
Temperance (MeSH)
Tobacco use
Wit and humor (MeSH)

MENUS
BT   Nutrition
RT   Allied health personnel
Body mass index
Body size
Caffeine
Cardiovascular risk factors
Cooking techniques
Diet
Dietary assessment
Dietary guidelines
Eating behaviour
Eating disorders
Food
Fruits and vegetables (HE)
Health behaviour
Infant nutrition (HE)
Nutrition education
Nutrition education
programmess
Nutritionists
Obesity
Parenteral nutrition
Recipes

Recommended dietary
allowances
Risk factor intervention
Weight control
Weight control programmess

MORBIDITY (HE)
BT   Wellness
RT   Ecological perspective
Health promotion
Holistic approach

MOTHER CHILD RELATIONS
BT   Loving relationships
RT   Attitude change (HE)
Attitudes (HE)
Child care
Children (HE)
Christianity (HE)
Communication problems (HE)
Communication skills (HE)
Coping (HE)
Divorce (HE)
Families (HE)
Husbands
Interpersonal skills (HE)
Listening skills (HE)
Marital status
Parent child relations
Parent responsibility
Persuasion (HE)
Psychological factors (HE)
Psychosocial factors (HE)
Religion (HE)
Self concept (HE)
Self efficacy (HE)
Single parent families (HE)
Wives

MUSCLE FATIGUE (MESH)
BT   Exercise
RT   Aerobic exercise (HE)
Body mass index (HE)
Body size (HE)
Diet (HE)
Eating disorders (HE)
Exercise movement techniques
(MeSH)
Exercise test (MeSH)
Exercise testing (HE)
Exercise therapy (MeSH)
Exercise tolerance (MeSH)
Health behaviour (HE)
Obesity (HE)
Physical activity (HE)

Physical fitness (HE)
Risk factor intervention (HE)
Weight control (HE)

NEEDS ASSESSMENT (MESH) (HE)
BT   Health
RT   American Public Health
      Association (MeSH)
      Behaviour change (HE)
      Behaviour modification (HE)
      Choice behaviour (MeSH)
      Chronic diseases and
      disorders (HE)
      Consumer health education
      Consumer health education
      programmess
      Family health (MeSH)
      Health attitude/Attitude to
      health (MeSH)
      Health behaviour (MeSH) (HE)
      Health beliefs (HE)
      Health care delivery (HE)
      Health care facilities (HE)
      Health care marketing (HE)
      Health care services (HE)
      Health clubs (HE)
      Health education (MeSH)
      Health education needs (HE)
      Health education objectives
      (HE)
      Health education standards
      (HE)
      Health educator patient
      relations (HE)
      Health educators (MeSH) (HE)
      Health facilities (MeSH)
      Health fairs (MeSH) (HE)
      Health field concept (HE)
      Health informatics
      Health literacy (HE)
      Health knowledge, attitudes,
      practice (MeSH)
      Health messages (HE)
      Health occupations (HE)
      Health officers (HE)
      Health personnel (HE)
      Health plan implementation
      (MeSH)
      Health planning (HE)
      Health priorities (MeSH)
      Health professionals (HE)
      Health promotion (MeSH) (HE)
      Health resorts (MeSH)
      Health risk appraisal (HE)
      Health status (MeSH)

Health status indicators
(MeSH)
Health surveys (MeSH)
Health systems agencies (HE)
Health values (HE)
Health visitors (HE)
Healthy people 2010 (HE)
Healthy people programmess
(MeSH)
Holistic health (MeSH)
Information dissemination (HE)
Internet (HE)
Organisations (MeSH)
Philosophy (HE)
Preventive health services
(MeSH)
Preventive medicine
Primary prevention (SN altering
behaviour patterns detrimental
to health)
Problem solving
Public health
Quality of life
Risk reduction behaviour
(MeSH)
Risk-taking (MeSH)
Self-care (MeSH)
Stages of change (HE)
Values clarification (HE)
Value systems (HE)

NUTRITION (MeSH) (HE)
NT   Allied health personnel
      Body mass index
      Body size
      Caffeine
      Cardiovascular risk factors
      Cooking techniques
      Diet
      Dietary assessment
      Dietary guidelines
      Eating behaviour
      Eating disorders
      Food
      Fruits and vegetables (HE)
      Health behaviour
      Infant nutrition (HE)
      Menus
      Nutrition education
      Nutrition education
      programmess
      Nutritionists
      Obesity
      Parenteral nutrition
      Recipes

Recommended dietary
allowances
Risk factor intervention
Weight control
Weight control programmess

NUTRITION EDUCATION
BT Nutrition
RT Allied health personnel
  Body mass index
  Body size
  Caffeine
  Cardiovascular risk factors
  Cooking techniques
  Diet
  Dietary assessment
  Dietary guidelines
  Eating behaviour
  Eating disorders
  Food
  Fruits and vegetables (HE)
  Health behaviour
  Infant nutrition (HE)
  Menus
  Nutrition education
  programmess
  Nutritionists
  Obesity
  Parenteral nutrition
  Recipes
  Recommended dietary
  allowances
  Risk factor intervention
  Weight control
  Weight control programmess

**NUTRITION EDUCATION
PROGRAMMESS**
BT Nutrition
RT Allied health personnel
  Body mass index
  Body size
  Caffeine
  Cardiovascular risk factors
  Cooking techniques
  Diet
  Dietary assessment
  Dietary guidelines
  Eating behaviour
  Eating disorders
  Food
  Fruits and vegetables (HE)
  Health behaviour
  Infant nutrition (HE)
  Menus

Nutrition education
Nutritionists
Obesity
Parenteral nutrition
Recipes
Recommended dietary
allowances
Risk factor intervention
Weight control
Weight control programmess

NUTRITIONISTS
BT Nutrition
RT Allied health personnel
  Body mass index
  Body size
  Caffeine
  Cardiovascular risk factors
  Cooking techniques
  Diet
  Dietary assessment
  Dietary guidelines
  Eating behaviour
  Eating disorders
  Food
  Fruits and vegetables (HE)
  Health behaviour
  Infant nutrition (HE)
  Menus
  Nutrition education
  Nutrition education
  programmess
  Obesity
  Parenteral nutrition
  Recipes
  Recommended dietary
  allowances
  Risk factor intervention
  Weight control
  Weight control programmess

OBESITY (HE)
BT Exercise
  Nutrition
RT Aerobic exercise (HE)
  Allied health personnel
  Body mass index (HE)
  Body size (HE)
  Caffeine
  Cardiovascular risk factors
  Cooking techniques
  Diet (HE)
  Dietary assessment
  Dietary guidelines
  Eating behaviour

Eating disorders (HE)
Exercise movement techniques (MeSH)
Exercise test (MeSH)
Exercise testing (HE)
Exercise therapy (MeSH)
Exercise tolerance (MeSH)
Food
Fruits and vegetables (HE)
Health behaviour (HE)
Infant nutrition (HE)
Menus
Muscle fatigue (MeSH)
Nutrition education
Nutrition education programmess
Nutritionists
Parenteral nutrition
Physical activity (HE)
Physical fitness (HE)
Recipes
Recommended dietary allowances
Risk factor intervention (HE)
Weight control (HE)
Weight control programmess

ORGANISATIONS (MESH)
BT   Health
RT   American Public Health Association (MeSH)
Behaviour change (HE)
Behaviour modification (HE)
Choice behaviour (MeSH)
Chronic diseases and disorders (HE)
Consumer health education
Consumer health education programmess
Family health (MeSH)
Health attitude/Attitude to health (MeSH)
Health behaviour (MeSH) (HE)
Health beliefs (HE)
Health care delivery (HE)
Health care facilities (HE)
Health care marketing (HE)
Health care services (HE)
Health clubs (HE)
Health education (MeSH)
Health education needs (HE)
Health education objectives (HE)
Health education standards (HE)

Health educator patient relations (HE)
Health educators (MeSH) (HE)
Health facilities (MeSH)
Health fairs (MeSH) (HE)
Health field concept (HE)
Health informatics
Health literacy (HE)
Health knowledge, attitudes, practice (MeSH)
Health messages (HE)
Health occupations (HE)
Health officers (HE)
Health personnel (HE)
Health plan implementation (MeSH)
Health planning (HE)
Health priorities (MeSH)
Health professionals (HE)
Health promotion (MeSH) (HE)
Health resorts (MeSH)
Health risk appraisal (HE)
Health status (MeSH)
Health status indicators (MeSH)
Health surveys (MeSH)
Health systems agencies (HE)
Health values (HE)
Health visitors (HE)
Healthy people 2010 (HE)
Healthy people programmess (MeSH)
Holistic health (MeSH)
Information dissemination (HE)
Internet (HE)
Needs assessment (MeSH) (HE)
Philosophy (HE)
Preventive health services (MeSH)
Preventive medicine
Primary prevention (SN altering behaviour patterns detrimental to health)
Problem solving
Public health
Quality of life
Risk reduction behaviour (MeSH)
Risk-taking (MeSH)
Self-care (MeSH)
Stages of change (HE)
Values clarification (HE)
Value systems (HE)

PARENT CHILD RELATIONS
BT   Loving relationships
RT   Attitude change (HE)
      Attitudes (HE)
      Child care
      Children (HE)
      Christianity (HE)
      Communication problems (HE)
      Communication skills (HE)
      Coping (HE)
      Divorce (HE)
      Families (HE)
      Husbands
      Interpersonal skills (HE)
      Listening skills (HE)
      Marital status
      Mother child relations
      Parent responsibility
      Persuasion (HE)
      Psychological factors (HE)
      Psychosocial factors (HE)
      Religion (HE)
      Self concept (HE)
      Self efficacy (HE)
      Single parent families (HE)
      Wives

PARENT RESPONSIBILITY
BT   Loving relationships
RT   Attitude change (HE)
      Attitudes (HE)
      Child care
      Children (HE)
      Christianity (HE)
      Communication problems (HE)
      Communication skills (HE)
      Coping (HE)
      Divorce (HE)
      Families (HE)
      Husbands
      Interpersonal skills (HE)
      Listening skills (HE)
      Marital status
      Mother child relations
      Parent child relations
      Persuasion (HE)
      Psychological factors (HE)
      Psychosocial factors (HE)
      Religion (HE)
      Self concept (HE)
      Self efficacy (HE)
      Single parent families (HE)
      Wives

PARENTERAL NUTRITION

BT   Nutrition
RT   Allied health personnel
      Body mass index
      Body size
      Caffeine
      Cardiovascular risk factors
      Cooking techniques
      Diet
      Dietary assessment
      Dietary guidelines
      Eating behaviour
      Eating disorders
      Food
      Fruits and vegetables (HE)
      Health behaviour
      Infant nutrition (HE)
      Menus
      Nutrition education
      Nutrition education
      programmess
      Nutritionists
      Obesity
      Recipes
      Recommended dietary
      allowances
      Risk factor intervention
      Weight control
      Weight control programmess

PERSUASION (HE)
BT   Loving relationships
RT   Attitude change (HE)
      Attitudes (HE)
      Child care
      Children (HE)
      Christianity (HE)
      Communication problems (HE)
      Communication skills (HE)
      Coping (HE)
      Divorce (HE)
      Families (HE)
      Husbands
      Interpersonal skills (HE)
      Listening skills (HE)
      Marital status
      Mother child relations
      Parent child relations
      Parent responsibility
      Psychological factors (HE)
      Psychosocial factors (HE)
      Religion (HE)
      Self concept (HE)
      Self efficacy (HE)
      Single parent families (HE)
      Wives

PHILOSOPHY (HE)
BT   Health
RT   American Public Health
Association (MeSH)
Behaviour change (HE)
Behaviour modification (HE)
Choice behaviour (MeSH)
Chronic diseases and
disorders (HE)
Consumer health education
Consumer health education
programmess
Family health (MeSH)
Health attitude/Attitude to
health (MeSH)
Health behaviour (MeSH) (HE)
Health beliefs (HE)
Health care delivery (HE)
Health care facilities (HE)
Health care marketing (HE)
Health care services (HE)
Health clubs (HE)
Health education (MeSH)
Health education needs (HE)
Health education objectives
(HE)
Health education standards
(HE)
Health educator patient
relations (HE)
Health educators (MeSH) (HE)
Health facilities (MeSH)
Health fairs (MeSH) (HE)
Health field concept (HE)
Health informatics
Health literacy (HE)
Health knowledge, attitudes,
practice (MeSH)
Health messages (HE)
Health occupations (HE)
Health officers (HE)
Health personnel (HE)
Health plan implementation
(MeSH)
Health planning (HE)
Health priorities (MeSH)
Health professionals (HE)
Health promotion (MeSH) (HE)
Health resorts (MeSH)
Health risk appraisal (HE)
Health status (MeSH)
Health status indicators
(MeSH)
Health surveys (MeSH)

Health systems agencies (HE)
Health values (HE)
Health visitors (HE)
Healthy people 2010 (HE)
Healthy people programmess
(MeSH)
Holistic health (MeSH)
Information dissemination (HE)
Internet (HE)
Needs assessment (MeSH)
(HE)
Organisations (MeSH)
Preventive health services
(MeSH)
Preventive medicine
Primary prevention (SN altering
behaviour patterns detrimental
to health)
Problem solving
Public health
Quality of life
Risk reduction behaviour
(MeSH)
Risk-taking (MeSH)
Self-care (MeSH)
Stages of change (HE)
Values clarification (HE)
Value systems (HE)

PHYSICAL ACTIVITY (HE)
BT   Exercise
RT   Aerobic exercise (HE)
Body mass index (HE)
Body size (HE)
Diet (HE)
Eating disorders (HE)
Exercise movement techniques
(MeSH)
Exercise test (MeSH)
Exercise testing (HE)
Exercise therapy (MeSH)
Exercise tolerance (MeSH)
Health behaviour (HE)
Muscle fatigue (MeSH)
Obesity (HE)
Physical fitness (HE)
Risk factor intervention (HE)
Weight control (HE)

PHYSICAL FITNESS (HE)
BT   Exercise
RT   Aerobic exercise (HE)
Body mass index (HE)
Body size (HE)
Diet (HE)

Eating disorders (HE)
Exercise movement techniques (MeSH)
Exercise test (MeSH)
Exercise testing (HE)
Exercise therapy (MeSH)
Exercise tolerance (MeSH)
Health behaviour (HE)
Muscle fatigue (MeSH)
Obesity (HE)
Physical activity (HE)
Risk factor intervention (HE)
Weight control (HE)

PREVENTIVE HEALTH SERVICES (MESH)
BT   Health
RT   American Public Health Association (MeSH)
    Behaviour change (HE)
    Behaviour modification (HE)
    Choice behaviour (MeSH)
    Chronic diseases and disorders (HE)
    Consumer health education
    Consumer health education programmess
    Family health (MeSH)
    Health attitude/Attitude to health (MeSH)
    Health behaviour (MeSH) (HE)
    Health beliefs (HE)
    Health care delivery (HE)
    Health care facilities (HE)
    Health care marketing (HE)
    Health care services (HE)
    Health clubs (HE)
    Health education (MeSH)
    Health education needs (HE)
    Health education objectives (HE)
    Health education standards (HE)
    Health educator patient relations (HE)
    Health educators (MeSH) (HE)
    Health facilities (MeSH)
    Health fairs (MeSH) (HE)
    Health field concept (HE)
    Health informatics
    Health literacy (HE)
    Health knowledge, attitudes, practice (MeSH)
    Health messages (HE)
    Health occupations (HE)

Health officers (HE)
Health personnel (HE)
Health plan implementation (MeSH)
Health planning (HE)
Health priorities (MeSH)
Health professionals (HE)
Health promotion (MeSH) (HE)
Health resorts (MeSH)
Health risk appraisal (HE)
Health status (MeSH)
Health status indicators (MeSH)
Health surveys (MeSH)
Health systems agencies (HE)
Health values (HE)
Health visitors (HE)
Healthy people 2010 (HE)
Healthy people programmess (MeSH)
Holistic health (MeSH)
Information dissemination (HE)
Internet (HE)
Needs assessment (MeSH) (HE)
Organisations (MeSH)
Philosophy (HE)
Preventive medicine
Primary prevention (SN altering behaviour patterns detrimental to health)
Problem solving
Public health
Quality of life
Risk reduction behaviour (MeSH)
Risk-taking (MeSH)
Self-care (MeSH)
Stages of change (HE)
Values clarification (HE)
Value systems (HE)

PREVENTIVE MEDICINE
BT   Health
RT   American Public Health Association (MeSH)
    Behaviour change (HE)
    Behaviour modification (HE)
    Choice behaviour (MeSH)
    Chronic diseases and disorders (HE)
    Consumer health education
    Consumer health education programmess
    Family health (MeSH)

Health attitude/Attitude to
health (MeSH)
Health behaviour (MeSH) (HE)
Health beliefs (HE)
Health care delivery (HE)
Health care facilities (HE)
Health care marketing (HE)
Health care services (HE)
Health clubs (HE)
Health education (MeSH)
Health education needs (HE)
Health education objectives
(HE)
Health education standards
(HE)
Health educator patient
relations (HE)
Health educators (MeSH) (HE)
Health facilities (MeSH)
Health fairs (MeSH) (HE)
Health field concept (HE)
Health informatics
Health literacy (HE)
Health knowledge, attitudes,
practice (MeSH)
Health messages (HE)
Health occupations (HE)
Health officers (HE)
Health personnel (HE)
Health plan implementation
(MeSH)
Health planning (HE)
Health priorities (MeSH)
Health professionals (HE)
Health promotion (MeSH) (HE)
Health resorts (MeSH)
Health risk appraisal (HE)
Health status (MeSH)
Health status indicators
(MeSH)
Health surveys (MeSH)
Health systems agencies (HE)
Health values (HE)
Health visitors (HE)
Healthy people 2010 (HE)
Healthy people programmess
(MeSH)
Holistic health (MeSH)
Information dissemination (HE)
Internet (HE)
Needs assessment (MeSH)
(HE)
Organisations (MeSH)
Philosophy (HE)

Preventive health services
(MeSH)
Primary prevention (SN altering
behaviour patterns detrimental
to health)
Problem solving
Public health
Quality of life
Risk reduction behaviour
(MeSH)
Risk-taking (MeSH)
Self-care (MeSH)
Stages of change (HE)
Values clarification (HE)
Value systems (HE)

**PRIMARY PREVENTION (SN
ALTERING BEHAVIOUR PATTERNS
DETRIMENTAL TO HEALTH)**
BT   Health
RT   American Public Health
        Association (MeSH)
        Behaviour change (HE)
        Behaviour modification (HE)
        Choice behaviour (MeSH)
        Chronic diseases and
        disorders (HE)
        Consumer health education
        Consumer health education
        programmess
        Family health (MeSH)
        Health attitude/Attitude to
        health (MeSH)
        Health behaviour (MeSH) (HE)
        Health beliefs (HE)
        Health care delivery (HE)
        Health care facilities (HE)
        Health care marketing (HE)
        Health care services (HE)
        Health clubs (HE)
        Health education (MeSH)
        Health education needs (HE)
        Health education objectives
        (HE)
        Health education standards
        (HE)
        Health educator patient
        relations (HE)
        Health educators (MeSH) (HE)
        Health facilities (MeSH)
        Health fairs (MeSH) (HE)
        Health field concept (HE)
        Health informatics
        Health literacy (HE)

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Health knowledge, attitudes, practice (MeSH)
Health messages (HE)
Health occupations (HE)
Health officers (HE)
Health personnel (HE)
Health plan implementation (MeSH)
Health planning (HE)
Health priorities (MeSH)
Health professionals (HE)
Health promotion (MeSH) (HE)
Health resorts (MeSH)
Health risk appraisal (HE)
Health status (MeSH)
Health status indicators (MeSH)
Health surveys (MeSH)
Health systems agencies (HE)
Health values (HE)
Health visitors (HE)
Healthy people 2010 (HE)
Healthy people programmess (MeSH)
Holistic health (MeSH)
Information dissemination (HE)
Internet (HE)
Needs assessment (MeSH) (HE)
Organisations (MeSH)
Philosophy (HE)
Preventive health services (MeSH)
Preventive medicine
Problem solving
Public health
Quality of life
Risk reduction behaviour (MeSH)
Risk-taking (MeSH)
Self-care (MeSH)
Stages of change (HE)
Values clarification (HE)
Value systems (HE)

PROBLEM SOLVING
BT   Health
RT   American Public Health
      Association (MeSH)
      Behaviour change (HE)
      Behaviour modification (HE)
      Choice behaviour (MeSH)
      Chronic diseases and
      disorders (HE)
      Consumer health education

Consumer health education programmess
Family health (MeSH)
Health attitude/Attitude to health (MeSH)
Health behaviour (MeSH) (HE)
Health beliefs (HE)
Health care delivery (HE)
Health care facilities (HE)
Health care marketing (HE)
Health care services (HE)
Health clubs (HE)
Health education (MeSH)
Health education needs (HE)
Health education objectives (HE)
Health education standards (HE)
Health educator patient relations (HE)
Health educators (MeSH) (HE)
Health facilities (MeSH)
Health fairs (MeSH) (HE)
Health field concept (HE)
Health informatics
Health literacy (HE)
Health knowledge, attitudes, practice (MeSH)
Health messages (HE)
Health occupations (HE)
Health officers (HE)
Health personnel (HE)
Health plan implementation (MeSH)
Health planning (HE)
Health priorities (MeSH)
Health professionals (HE)
Health promotion (MeSH) (HE)
Health resorts (MeSH)
Health risk appraisal (HE)
Health status (MeSH)
Health status indicators (MeSH)
Health surveys (MeSH)
Health systems agencies (HE)
Health values (HE)
Health visitors (HE)
Healthy people 2010 (HE)
Healthy people programmess (MeSH)
Holistic health (MeSH)
Information dissemination (HE)
Internet (HE)
Needs assessment (MeSH) (HE)

Organisations (MeSH)
Philosophy (HE)
Preventive health services (MeSH)
Preventive medicine
Primary prevention (SN altering behaviour patterns detrimental to health)
Public health
Quality of life
Risk reduction behaviour (MeSH)
Risk-taking (MeSH)
Self-care (MeSH)
Stages of change (HE)
Values clarification (HE)
Value systems (HE)

PSYCHOLOGICAL FACTORS (HE)
BT Life in balance
    Lifestyle
    Loving relationships
RT Abstinence
    Addiction
    Adjustment
    Alcohol use
    Attitude change (HE)
    Attitudes (HE)
    Cardiovascular risk factors (HE)
    Child care
    Children (HE)
    Christianity (HE)
    Communication problems (HE)
    Communication skills (HE)
    Coping (HE)
    Decision-making
    Depression (HE)
    Divorce (HE)
    Drug use
    Empowerment (HE)
    Families (HE)
    Health behaviour
    Human sexuality
    Husbands
    Independent living
    Interpersonal skills (HE)
    Laughter (MeSH)
    Laughter therapy (MeSH)
    Listening skills (HE)
    Marital status
    Mental illness (HE)
    Mother child relations
    Parent child relations
    Parent responsibility

Persuasion (HE)
Psychosocial factors (HE)
Quality of life
Religion (HE)
Risk factor intervention
Self concept (HE)
Self efficacy (HE)
Sex behaviour
Single parent families (HE)
Temperance (MeSH)
Tobacco use
Wit and humor (MeSH)
Wives

PSYCHOSOCIAL FACTORS (HE)
BT Life in balance
    Loving relationships
RT Abstinence
    Addiction
    Adjustment
    Alcohol use
    Attitude change (HE)
    Attitudes (HE)
    Cardiovascular risk factors (HE)
    Child care
    Children (HE)
    Christianity (HE)
    Communication problems (HE)
    Communication skills (HE)
    Coping (HE)
    Depression
    Divorce (HE)
    Drug use
    Empowerment
    Families (HE)
    Health behaviour
    Human sexuality
    Husbands
    Independent living
    Interpersonal skills (HE)
    Laughter (MeSH)
    Laughter therapy (MeSH)
    Listening skills (HE)
    Marital status
    Mental illness (HE)
    Mother child relations
    Parent child relations
    Parent responsibility
    Persuasion (HE)
    Psychological factors (HE)
    Religion (HE)
    Self concept (HE)
    Self efficacy (HE)
    Sex behaviour

Single parent families (HE)
Temperance (MeSH)
Tobacco use
Wit and humor (MeSH)
Wives

PUBLIC HEALTH
BT Health
RT American Public Health
    Association (MeSH)
    Behaviour change (HE)
    Behaviour modification (HE)
    Choice behaviour (MeSH)
    Chronic diseases and
    disorders (HE)
    Consumer health education
    Consumer health education
    programmess
    Family health (MeSH)
    Health attitude/Attitude to
    health (MeSH)
    Health behaviour (MeSH) (HE)
    Health beliefs (HE)
    Health care delivery (HE)
    Health care facilities (HE)
    Health care marketing (HE)
    Health care services (HE)
    Health clubs (HE)
    Health education (MeSH)
    Health education needs (HE)
    Health education objectives
    (HE)
    Health education standards
    (HE)
    Health educator patient
    relations (HE)
    Health educators (MeSH) (HE)
    Health facilities (MeSH)
    Health fairs (MeSH) (HE)
    Health field concept (HE)
    Health informatics
    Health literacy (HE)
    Health knowledge, attitudes,
    practice (MeSH)
    Health messages (HE)
    Health occupations (HE)
    Health officers (HE)
    Health personnel (HE)
    Health plan implementation
    (MeSH)
    Health planning (HE)
    Health priorities (MeSH)
    Health professionals (HE)
    Health promotion (MeSH) (HE)
    Health resorts (MeSH)

Health risk appraisal (HE)
Health status (MeSH)
Health status indicators
(MeSH)
Health surveys (MeSH)
Health systems agencies (HE)
Health values (HE)
Health visitors (HE)
Healthy people 2010 (HE)
Healthy people programmess
(MeSH)
Holistic health (MeSH)
Information dissemination (HE)
Internet (HE)
Needs assessment (MeSH)
(HE)
Organisations (MeSH)
Philosophy (HE)
Preventive health services
(MeSH)
Preventive medicine
Primary prevention (SN altering
behaviour patterns detrimental
to health)
Problem solving
Quality of life
Risk reduction behaviour
(MeSH)
Risk-taking (MeSH)
Self-care (MeSH)
Stages of change (HE)
Values clarification (HE)
Value systems (HE)

QUALITY OF LIFE (HE)
BT Health
    Lifestyle
RT Adjustment
    American Public Health
    Association (MeSH)
    Attitude change
    Attitudes
    Behaviour change (HE)
    Behaviour modification (HE)
    Choice behaviour (MeSH)
    Chronic diseases and
    disorders (HE)
    Consumer health education
    Consumer health education
    programmess
    Decision-making
    Family health (MeSH)
    Health attitude/Attitude to
    health (MeSH)

Health behaviour
Health beliefs (HE)
Health care delivery (HE)
Health care facilities (HE)
Health care marketing (HE)
Health care services (HE)
Health clubs (HE)
Health education (MeSH)
Health education needs (HE)
Health education objectives
(HE)
Health education standards
(HE)
Health educator patient
relations (HE)
Health educators (MeSH) (HE)
Health facilities (MeSH)
Health fairs (MeSH) (HE)
Health field concept (HE)
Health informatics
Health literacy (HE)
Health knowledge, attitudes,
practice (MeSH)
Health messages (HE)
Health occupations (HE)
Health officers (HE)
Health personnel (HE)
Health plan implementation
(MeSH)
Health planning (HE)
Health priorities (MeSH)
Health professionals (HE)
Health promotion (MeSH) (HE)
Health resorts (MeSH)
Health risk appraisal (HE)
Health status (MeSH)
Health status indicators
(MeSH)
Health surveys (MeSH)
Health systems agencies (HE)
Health values (HE)
Health visitors (HE)
Healthy people 2010 (HE)
Healthy people programmess
(MeSH)
Holistic health (MeSH)
Human sexuality
Independent living
Information dissemination (HE)
Internet (HE)
Needs assessment (MeSH)
(HE)
Organisations (MeSH)
Philosophy (HE)

Preventive health services
(MeSH)
Preventive medicine
Primary prevention (SN altering
behaviour patterns detrimental
to health)
Problem solving
Psychological factors
Public health
Risk factor intervention
Risk reduction behaviour
(MeSH)
Risk-taking (MeSH)
Self-care (MeSH)
Stages of change (HE)
Values clarification (HE)
Value systems (HE)

RECIPES
BT   Nutrition
RT   Allied health personnel
       Body mass index
       Body size
       Caffeine
       Cardiovascular risk factors
       Cooking techniques
       Diet
       Dietary assessment
       Dietary guidelines
       Eating behaviour
       Eating disorders
       Food
       Fruits and vegetables (HE)
       Health behaviour
       Infant nutrition (HE)
       Menus
       Nutrition education
       Nutrition education
       programmess
       Nutritionists
       Obesity
       Parenteral nutrition
       Recommended dietary
       allowances
       Risk factor intervention
       Weight control
       Weight control programmess

RECOMMENDED DIETARY
ALLOWANCES
BT   Nutrition
RT   Allied health personnel
       Body mass index
       Body size
       Caffeine

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Cardiovascular risk factors
Cooking techniques
Diet
Dietary assessment
Dietary guidelines
Eating behaviour
Eating disorders
Food
Fruits and vegetables (HE)
Health behaviour
Infant nutrition (HE)
Menus
Nutrition education
Nutrition education
programmess
Nutritionists
Obesity
Parenteral nutrition
Recipes
Risk factor intervention
Weight control
Weight control programmess

RELIGION (HE)
BT   Loving relationships
RT   Attitude change (HE)
      Attitudes (HE)
      Child care
      Children (HE)
      Christianity (HE)
      Communication problems (HE)
      Communication skills (HE)
      Coping (HE)
      Divorce (HE)
      Families (HE)
      Husbands
      Interpersonal skills (HE)
      Listening skills (HE)
      Marital status
      Mother child relations
      Parent child relations
      Parent responsibility
      Persuasion (HE)
      Psychological factors (HE)
      Psychosocial factors (HE)
      Self concept (HE)
      Self efficacy (HE)
      Single parent families (HE)
      Wives

REMEDIES
BT   Wellness

RESPIRATION (MESH)
BT   Fresh Air

RT   Air (MeSH)
      Air ionisation (MeSH)
      Air pollutants (MeSH)
      Breathing exercises (MeSH)

REST
RT   Relaxation
NT   Bed rest (MeSH)
      Fatigue (MeSH)
      Mental fatigue (MeSH)
      Mental health (HE)
      Physical fitness (HE)
      Sleep (MeSH)
      Sleep deprivation (MeSH)
      Sleep stages (MeSH)
      Sleep, REM (MeSH)

RELAXATION
RT   Rest
NT   Behaviour modification (HE)
      Biofeedback (HE)
      Fatigue (MeSH)
      Relaxation methods (HE)
      Relaxation techniques (MeSH)
      Stress management (HE)

RISK FACTOR INTERVENTION (HE)
BT   Exercise
      Lifestyle
      Nutrition
RT   Adjustment
      Aerobic exercise (HE)
      Allied health personnel
      Attitude change
      Attitudes
      Body mass index (HE)
      Body size (HE)
      Caffeine
      Cardiovascular risk factors
      Cooking techniques
      Decision-making
      Diet (HE)
      Dietary assessment
      Dietary guidelines
      Eating behaviour
      Eating disorders (HE)
      Exercise movement techniques (MeSH)
      Exercise test (MeSH)
      Exercise testing (HE)
      Exercise therapy (MeSH)
      Exercise tolerance (MeSH)
      Food
      Fruits and vegetables
      Health behaviour (HE)

Human sexuality
Independent living
Infant nutrition (HE)
Menus
Muscle fatigue (MeSH)
Nutrition education
Nutrition education
programmess
Nutritionists
Obesity (HE)
Parenteral nutrition
Physical activity (HE)
Physical fitness (HE)
Psychological factors
Quality of life
Recipes
Recommended dietary
allowances
Weight control (HE)
Weight control programmess

**RISK REDUCTION BEHAVIOUR
(MESH)**
BT   Health
RT   American Public Health
      Association (MeSH)
      Behaviour change (HE)
      Behaviour modification (HE)
      Choice behaviour (MeSH)
      Chronic diseases and
      disorders (HE)
      Consumer health education
      Consumer health education
      programmess
      Family health (MeSH)
      Health attitude/Attitude to
      health (MeSH)
      Health behaviour (MeSH) (HE)
      Health beliefs (HE)
      Health care delivery (HE)
      Health care facilities (HE)
      Health care marketing (HE)
      Health care services (HE)
      Health clubs (HE)
      Health education (MeSH)
      Health education needs (HE)
      Health education objectives
      (HE)
      Health education standards
      (HE)
      Health educator patient
      relations (HE)
      Health educators (MeSH) (HE)
      Health facilities (MeSH)
      Health fairs (MeSH) (HE)

Health field concept (HE)
Health informatics
Health literacy (HE)
Health knowledge, attitudes,
practice (MeSH)
Health messages (HE)
Health occupations (HE)
Health officers (HE)
Health personnel (HE)
Health plan implementation
(MeSH)
Health planning (HE)
Health priorities (MeSH)
Health professionals (HE)
Health promotion (MeSH) (HE)
Health resorts (MeSH)
Health risk appraisal (HE)
Health status (MeSH)
Health status indicators
(MeSH)
Health surveys (MeSH)
Health systems agencies (HE)
Health values (HE)
Health visitors (HE)
Healthy people 2010 (HE)
Healthy people programmess
(MeSH)
Holistic health (MeSH)
Information dissemination (HE)
Internet (HE)
Needs assessment (MeSH)
(HE)
Organisations (MeSH)
Philosophy (HE)
Preventive health services
(MeSH)
Preventive medicine
Primary prevention (SN altering
behaviour patterns detrimental
to health)
Problem solving
Public health
Quality of life
Risk-taking (MeSH)
Self-care (MeSH)
Stages of change (HE)
Values clarification (HE)
Value systems (HE)

RISK-TAKING (MESH)
BT   Health
RT   American Public Health
      Association (MeSH)
      Behaviour change (HE)
      Behaviour modification (HE)

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Choice behaviour (MeSH)
Chronic diseases and
disorders (HE)
Consumer health education
Consumer health education
programmess
Family health (MeSH)
Health attitude/Attitude to
health (MeSH)
Health behaviour (MeSH) (HE)
Health beliefs (HE)
Health care delivery (HE)
Health care facilities (HE)
Health care marketing (HE)
Health care services (HE)
Health clubs (HE)
Health education (MeSH)
Health education needs (HE)
Health education objectives
(HE)
Health education standards
(HE)
Health educator patient
relations (HE)
Health educators (MeSH) (HE)
Health facilities (MeSH)
Health fairs (MeSH) (HE)
Health field concept (HE)
Health informatics
Health literacy (HE)
Health knowledge, attitudes,
practice (MeSH)
Health messages (HE)
Health occupations (HE)
Health officers (HE)
Health personnel (HE)
Health plan implementation
(MeSH)
Health planning (HE)
Health priorities (MeSH)
Health professionals (HE)
Health promotion (MeSH) (HE)
Health resorts (MeSH)
Health risk appraisal (HE)
Health status (MeSH)
Health status indicators
(MeSH)
Health surveys (MeSH)
Health systems agencies (HE)
Health values (HE)
Health visitors (HE)
Healthy people 2010 (HE)
Healthy people programmess
(MeSH)
Holistic health (MeSH)

Information dissemination (HE)
Internet (HE)
Needs assessment (MeSH)
(HE)
Organisations (MeSH)
Philosophy (HE)
Preventive health services
(MeSH)
Preventive medicine
Primary prevention (SN altering
behaviour patterns detrimental
to health)
Problem solving
Public health
Quality of life
Risk reduction behaviour
(MeSH)
Self-care (MeSH)
Stages of change (HE)
Values clarification (HE)
Value systems (HE)

SELF-CARE (MESH)
BT   Health
RT   American Public Health
        Association (MeSH)
        Behaviour change (HE)
        Behaviour modification (HE)
        Choice behaviour (MeSH)
        Chronic diseases and
        disorders (HE)
        Consumer health education
        Consumer health education
        programmess
        Family health (MeSH)
        Health attitude/Attitude to
        health (MeSH)
        Health behaviour (MeSH) (HE)
        Health beliefs (HE)
        Health care delivery (HE)
        Health care facilities (HE)
        Health care marketing (HE)
        Health care services (HE)
        Health clubs (HE)
        Health education (MeSH)
        Health education needs (HE)
        Health education objectives
        (HE)
        Health education standards
        (HE)
        Health educator patient
        relations (HE)
        Health educators (MeSH) (HE)
        Health facilities (MeSH)
        Health fairs (MeSH) (HE)

Health field concept (HE)
Health informatics
Health literacy (HE)
Health knowledge, attitudes,
practice (MeSH)
Health messages (HE)
Health occupations (HE)
Health officers (HE)
Health personnel (HE)
Health plan implementation
(MeSH)
Health planning (HE)
Health priorities (MeSH)
Health professionals (HE)
Health promotion (MeSH) (HE)
Health resorts (MeSH)
Health risk appraisal (HE)
Health status (MeSH)
Health status indicators
(MeSH)
Health surveys (MeSH)
Health systems agencies (HE)
Health values (HE)
Health visitors (HE)
Healthy people 2010 (HE)
Healthy people programmess
(MeSH)
Holistic health (MeSH)
Information dissemination (HE)
Internet (HE)
Needs assessment (MeSH)
(HE)
Organisations (MeSH)
Philosophy (HE)
Preventive health services
(MeSH)
Preventive medicine
Primary prevention (SN altering
behaviour patterns detrimental
to health)
Problem solving
Public health
Quality of life
Risk reduction behaviour
(MeSH)
Risk-taking (MeSH)
Stages of change (HE)
Values clarification (HE)
Value systems (HE)

SELF CONCEPT (HE)
BT   Loving relationships
RT   Attitude change (HE)
       Attitudes (HE)
       Child care

Children (HE)
Christianity (HE)
Communication problems (HE)
Communication skills (HE)
Coping (HE)
Divorce (HE)
Families (HE)
Husbands
Interpersonal skills (HE)
Listening skills (HE)
Marital status
Mother child relations
Parent child relations
Parent responsibility
Persuasion (HE)
Psychological factors (HE)
Psychosocial factors (HE)
Religion (HE)
Self efficacy (HE)
Single parent families (HE)
Wives

SELF EFFICACY (HE)
BT   Life in balance
       Loving relationships
RT   Abstinence
       Addiction (?)
       Adjustment (HE)
       Alcohol use
       Attitude change (HE)
       Attitudes
       Cardiovascular risk factors
       (HE)
       Child care
       Children (HE)
       Christianity (HE)
       Communication problems (HE)
       Communication skills (HE)
       Coping (HE)
       Depression (HE)
       Divorce
       Drug use
       Empowerment (HE)
       Families
       Health behaviour
       Human sexuality
       Husbands
       Independent living (HE)
       Interpersonal skills (HE)
       Laughter (MeSH)
       Laughter therapy (MeSH)
       Listening skills (HE)
       Marital status
       Mental illness (HE)
       Mother child relations

Parent child relations
Parent responsibility
Persuasion
Psychological factors (HE)
Psychosocial factors (HE)
Religion
Self concept
Sex behaviour
Single parent families
Temperance (MeSH)
Tobacco use
Wit and humor (MeSH)
Wives

SEX BEHAVIOUR
BT   Life in balance
RT   Abstinence
Addiction (?)
Adjustment (HE)
Alcohol use
Attitude change (HE)
Cardiovascular risk factors
(HE)
Coping (HE)
Depression (HE)
Drug use
Empowerment (HE)
Health behaviour
Human sexuality
Independent living (HE)
Laughter (MeSH)
Laughter therapy (MeSH)
Mental illness (HE)
Psychological factors (HE)
Psychosocial factors (HE)
Self efficacy (HE)
Temperance (MeSH)
Tobacco use
Wit and humor (MeSH)

SINGLE PARENT FAMILIES (HE)
BT   Loving relationships
RT   Attitude change (HE)
Attitudes (HE)
Child care
Children (HE)
Christianity (HE)
Communication problems (HE)
Communication skills (HE)
Coping (HE)
Divorce (HE)
Families (HE)
Husbands
Interpersonal skills (HE)
Listening skills (HE)

Marital status
Mother child relations
Parent child relations
Parent responsibility
Persuasion (HE)
Psychological factors (HE)
Psychosocial factors (HE)
Religion (HE)
Self concept (HE)
Self efficacy (HE)
Wives

SKIN DISEASES AND DISORDERS (HE)
BT   Sunlight
RT   Burns (HE)
Dermatology (HE)
Sun exposure (HE)
Sun sensitivity (HE)
Sunburn (HE)
Sunlight (HE)
Sunscreening agents (HE)
Sunstroke (MeSH)
Tanning booths (HE)
Ultraviolet radiation (HE)

STAGES OF CHANGE (HE)
BT   Health
RT   American Public Health
Association (MeSH)
Behaviour change (HE)
Behaviour modification (HE)
Choice behaviour (MeSH)
Chronic diseases and
disorders (HE)
Consumer health education
Consumer health education
programmess
Family health (MeSH)
Health attitude/Attitude to
health (MeSH)
Health behaviour (MeSH) (HE)
Health beliefs (HE)
Health care delivery (HE)
Health care facilities (HE)
Health care marketing (HE)
Health care services (HE)
Health clubs (HE)
Health education (MeSH)
Health education needs (HE)
Health education objectives
(HE)
Health education standards
(HE)

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Health educator patient relations (HE)
Health educators (MeSH) (HE)
Health facilities (MeSH)
Health fairs (MeSH) (HE)
Health field concept (HE)
Health informatics
Health literacy (HE)
Health knowledge, attitudes, practice (MeSH)
Health messages (HE)
Health occupations (HE)
Health officers (HE)
Health personnel (HE)
Health plan implementation (MeSH)
Health planning (HE)
Health priorities (MeSH)
Health professionals (HE)
Health promotion (MeSH) (HE)
Health resorts (MeSH)
Health risk appraisal (HE)
Health status (MeSH)
Health status indicators (MeSH)
Health surveys (MeSH)
Health systems agencies (HE)
Health values (HE)
Health visitors (HE)
Healthy people 2010 (HE)
Healthy people programmess (MeSH)
Holistic health (MeSH)
Information dissemination (HE)
Internet (HE)
Needs assessment (MeSH) (HE)
Organisations (MeSH)
Philosophy (HE)
Preventive health services (MeSH)
Preventive medicine
Primary prevention (SN altering behaviour patterns detrimental to health)
Problem solving
Public health
Quality of life
Risk reduction behaviour (MeSH)
Risk-taking (MeSH)
Self-care (MeSH)
Values clarification (HE)
Value systems (HE)

STATISTICS
BT   Wellness

STRESS FACTORS
BT   Cardiovascular risk factors
NT   Occupational stress
        Psychological stress
RT   Fear
        Patient anxiety
        Psychological factors
        Psychosomatic illnesses
        Stress management
        Suicide

STRESS MANAGEMENT
RT   Biofeedback (HE)
        Cardiovascular risk factors (HE)
        Conflict resolution (HE)
        Facilitators (HE)
        Fear
        Mental health education (HE)
        Occupational stress (HE)
        Patient anxiety (HE)
        Psychological factors (HE)
        Psychological stress (HE)
        Psychosomatic illnesses (HE)
        Relaxation methods (HE)
        Stress (MeSH)
        Stress factors (HE)
        Stress management (HE)
        Stress management programmess (HE)
        Suicide (HE)
        Violence (HE)

STRESS MANAGEMENT PROGRAMMESS
RT   Stress management

SUNBURN (HE)
BT   Sunlight
RT   Burns (HE)
        Dermatology (HE)
        Skin diseases and disorders (HE)
        Sun exposure (HE)
        Sun sensitivity (HE)
        Sunlight (HE)
        Sunscreening agents (HE)
        Sunstroke (MeSH)
        Tanning booths (HE)
        Ultraviolet radiation (HE)

SUN EXPOSURE (HE)

BT   Sunlight
RT   Burns (HE)
      Dermatology (HE)
      Skin diseases and disorders
      (HE)
      Sun sensitivity (HE)
      Sunburn (HE)
      Sunlight (HE)
      Sunscreening agents (HE)
      Sunstroke (MeSH)
      Tanning booths (HE)
      Ultraviolet radiation (HE)

SUNLIGHT (HE)
BT   Sunlight
NT   Burns (HE)
      Dermatology (HE)
      Skin diseases and disorders
      (HE)
      Sun exposure (HE)
      Sun sensitivity (HE)
      Sunburn (HE)
      Sunlight (HE)
      Sunscreening agents (HE)
      Sunstroke (MeSH)
      Tanning booths (HE)
      Ultraviolet radiation (HE)
RT   Burns (HE)
      Dermatology (HE)
      Skin diseases and disorders
      (HE)
      Sun exposure (HE)
      Sun sensitivity (HE)
      Sunburn (HE)
      Sunscreening agents (HE)
      Sunstroke (MeSH)
      Tanning booths (HE)
      Ultraviolet radiation (HE)

SUNSCREENING AGENTS (HE)
BT   Sunlight
RT   Burns (HE)
      Dermatology (HE)
      Skin diseases and disorders
      (HE)
      Sun exposure (HE)
      Sun sensitivity (HE)
      Sunburn (HE)
      Sunlight (HE)
      Sunstroke (MeSH)
      Tanning booths (HE)
      Ultraviolet radiation (HE)

SUN SENSITIVITY (HE)

BT   Sunlight
RT   Burns (HE)
      Dermatology (HE)
      Skin diseases and disorders
      (HE)
      Sun exposure (HE)
      Sunburn (HE)
      Sunlight (HE)
      Sunscreening agents (HE)
      Sunstroke (MeSH)
      Tanning booths (HE)
      Ultraviolet radiation (HE)

SUNSTROKE (MESH)
BT   Sunlight
RT   Burns (HE)
      Dermatology (HE)
      Skin diseases and disorders
      (HE)
      Sun exposure (HE)
      Sun sensitivity (HE)
      Sunburn (HE)
      Sunlight (HE)
      Sunscreening agents (HE)
      Tanning booths (HE)
      Ultraviolet radiation (HE)

TANNING BOOTHS (HE)
BT   Sunlight
RT   Burns (HE)
      Dermatology (HE)
      Skin diseases and disorders
      (HE)
      Sun exposure (HE)
      Sun sensitivity (HE)
      Sunburn (HE)
      Sunlight (HE)
      Sunscreening agents (HE)
      Sunstroke (MeSH)
      Ultraviolet radiation (HE)

TEMPERANCE (MESH)
BT   Life in balance
RT   Abstinence
      Addiction (?)
      Adjustment (HE)
      Alcohol use
      Attitude change (HE)
      Cardiovascular risk factors
      (HE)
      Coping (HE)
      Depression (HE)
      Drug use
      Empowerment (HE)
      Health behaviour

Human sexuality
Independent living (HE)
Laughter (MeSH)
Laughter therapy (MeSH)
Mental illness (HE)
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Tobacco use
Wit and humor (MeSH)

THERAPIES
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RT   Baths (MeSH)
       Dehydration (MeSH)
       Drinking (MeSH)
       Drinking behaviour (MeSH)
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       Hydrotherapy (MeSH)
       Water purification (MeSH)

TOBACCO USE
BT   Life in balance
RT   Abstinence
       Addiction (?)
       Adjustment (HE)
       Alcohol use
       Attitude change (HE)
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       Coping (HE)
       Depression (HE)
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       Laughter therapy (MeSH)
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       Psychosocial factors (HE)
       Self efficacy (HE)
       Sex behaviour
       Temperance (MeSH)
       Wit and humor (MeSH)

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BT   Sunlight
RT   Burns (HE)
       Dermatology (HE)

Skin diseases and disorders (HE)
Sun exposure (HE)
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Sunburn (HE)
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Sunstroke (MeSH)
Tanning booths (HE)

VALUES CLARIFICATION (HE)
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RT   American Public Health Association (MeSH)
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Self-care (MeSH)
Stages of change (HE)
Value systems (HE)

VALUE SYSTEMS (HE)
BT   Health
RT   American Public Health
      Association
      Behaviour change (HE)
      Behaviour modification (HE)
      Choice behaviour (MeSH)
      Chronic diseases and
      disorders (HE)
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Preventive medicine

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Primary prevention (SN altering
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Hydration (?)
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Thirst (MeSH)
Water purification (MeSH)

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RT   Aerobic exercise (HE)
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**WEIGHT CONTROL
PROGRAMMESS**
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RT   Allied health personnel
Body mass index
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WELLNESS (HE)
NT   Disease prevention
Ecological perspective
Health
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      Coping (HE)
      Depression (HE)
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      Tobacco use

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RT   Attitude change (HE)
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      Divorce (HE)
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      Listening skills (HE)
      Marital status
      Mother child relations
      Parent child relations
      Parent responsibility
      Persuasion (HE)
      Psychological factors (HE)
      Psychosocial factors (HE)
      Religion (HE)

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Self efficacy (HE)
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USE Females

WOMENS HEALTH
RT   Females
      Fertility
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WELLNESS

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Research data evidences that a lifestyle associated with the consumption of a diet of whole grains, vegetables, nuts, fruits, avoidance of meat and high-fat animal products, moderation in amount of food eaten, abstinence from alcohol and tobacco promotes health and reduces risk of chronic disease substantially (Craig 1999:25)

Welcome

Wellness….
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Health…
• Is psycho-physical wellbeing (WHO 2005)
• Is dependent on what we put into our bodies and what we do with our bodies (Nedley 1998:1)

A marked improvement in health is possible for those who will practice sound principles of healthful living (Heathman & Tillotson 2004)

General Wellness

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GENERAL WELLNESS

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• Dehydration
• Drinking behavior
• Hydration
• Hydrotherapy
• Thirst
• Water purification

Benefits…
• Strengthens the immune system
• Reduces fatigue
• Removes impurities from body
• Improves mental alertness

Tips…
• Start the day with 2 glasses of water
• Drink 8-10 glasses per day
• Avoid soft drinks, coffee and tea

Contrast shower…
• Stimulates circulation
• Strengthens immune system
• Good treatment for colds and flu
• Promotes healing

70% of the human body is water

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EXERCISE

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• Aerobic exercise
• Exercise therapy
• Physical activity
• Physical fitness

Benefits...

Circulation
• Strengthens heart muscle
• Lowers high blood pressure
• Lowers risk of heart disease

Immune system
• Protects against infections
• Increases cancer protection

Muscles
• Increases energy and endurance
• Improves muscle tone
• Burns excess calories

Nerves
• Vitalizes the brain
• Increases sense of well-being

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LIFE IN BALANCE

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• Self efficacy
• Temperance

• Abstinence
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• Health behavior
• Psychological factors
• Psychosocial factors
• Quality of life

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Benefits…
• Sweet, serene disposition
• Self-control
• Freedom of choice
• Moral power
• Body receives necessary sun, oxygen, exercise, peace, rest, water, nutrition
• Genuine pleasure & satisfaction
• Coping ability

Unbalanced lifestyle…
• Obesity
• Stress
• Addictions
• Sleep deprivation
• Euphoria-false pleasure

True temperance teaches us to dispense entirely with everything hurtful and to use judiciously that which is healthful (PP 562)
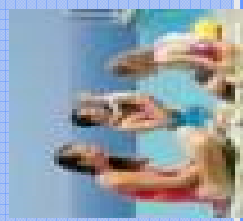
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LOVING RELATIONSHIPS

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- Children
- Christianity
- Communication skills
- Families
- Family health
- Husbands
- Interpersonal skills
- Listening skills

- Mother child relations
- Parent child relations
- Parent responsibility
- Religion
- Single parent families
- Wives

Since God so loved us, we also ought to love one another. No one has ever seen God, but if we love one another, God lives in us and His love is made complete in us (1 John 4:7)
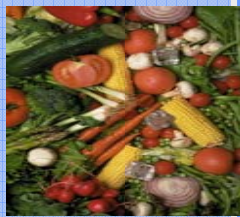
Welcome

How we relate to others is a significant determinant of health and illness (Craig 2005)

Positive relationships appear to significantly buffer the ill effects of blood pressure, elevated cholesterol and other risk factors for heart disease

Tips for healthy relationships…

- Offer unconditional love to all family members

- Express sincere concern & support for someone in difficulty or distress

- Show kindness to someone with disabilities or in need

- Respect & acknowledge the sincere efforts of friends & colleagues

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NUTRITION

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- Diet
- Eating behavior
- Food
- Menus
- Nutrition
- Recipes
- Weight control

Grains, fruits, nuts and vegetables constitute the diet chosen for us by our Creator. These foods, prepared in as simple and healthful a manner as possible are the most healthful and nourishing. They impart a strength, a power of endurance, and a vigor of intellect, that are not afforded by a more complex and stimulating diet (CDF 313)

Welcome

To develop a lifestyle in accordance with the laws that will promote health…

- Learn basic anatomy & physiology
- Learn how to keep the delicate machinery operating smoothly
- Learn which foods supply good building blocks
- Make lifestyle changes slowly
- Study from cause to effect

Tips for weight management…

- Set a realistic goal of 4-8 pounds per month
- Move it to lose it

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ENJOY REST & RELAXATION

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- Bed rest
- Behavior modification
- Fatigue
- Relaxation
- Relaxation techniques
- Rest
- Sleep
- Stress management

Benefits…
- Improves immunity
- Enhances ability to cope with pain
- Body is repaired during sleep
- Improves ability to learn
- Restores vigor & strength

Forms of rest…
- Short breaks
- Vacation
- A change
- Catnaps
- Weekly day of rest
- Useful activities, e.g. gardening

Guidelines for beneficial rest…
- 7-8 hrs per night
- Mostly before midnight

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Come unto me all ye that labor and are heavy laden and I will give you rest (Matthew 11:28)
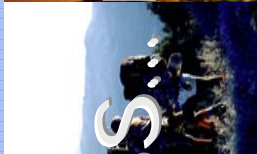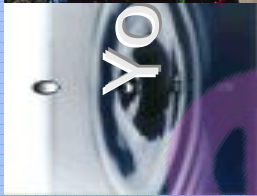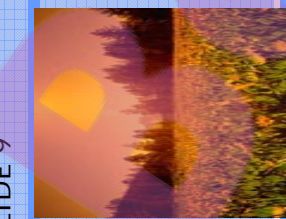
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SUNLIGHT & FRESH AIR

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•Ultraviolet radiation

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Stress management

•Air
•Breathing exercises
•Burns
•Respiration
•Sun exposure
•Sunlight
•Sun sensitivity

Sunlight benefits...
•Vitamin D production
•Sense of well-being
•Liver stimulated
•Immune system strengthened
•Blood pressure normalized
•Sleep quality improved
•Stress decreased
•Healing of wounds promoted
•Decreases blood sugar
•Children's blood circulation increased

Fresh air benefits...
•Purification of blood
•Nerves soothed
•Appetite stimulated
•Aids digestion
•Sound sleep induced
•Brings life to skin
•Imparts serenity

The Sun of Righteousness will dawn on those who honor My name, healing radiating from its wings. You will be bursting with energy, like colts frisking and frolicking (Malachi 4:2)

The strength of the system is... dependent upon the amount of pure, fresh air breathed (HL 71)
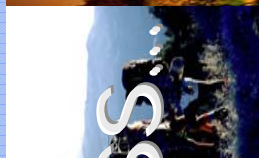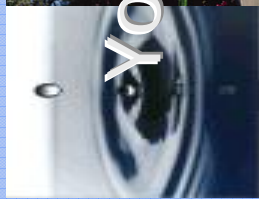
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STRESS MANAGEMENT

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• Fear
• Occupational stress
• Psychological factors
• Psychological stress
• Psychosomatic illnesses
• Stress
• Stress factors
• Stress management programs

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Stress management

70-80% of all illness is due to stress

Positive thoughts…

• Cheerfulness promotes circulation & aids digestion
• The will directed in the right direction gives energy to the nerves & soothes them
• The immune system is strengthened by trusting in God

Negative thoughts and emotions affect the cells of the body

Coping tips…

• Identify stress factors
• Set boundaries
• Regulate life
• Exercise, drink water, breathe fresh air
• Help someone
• Eat nourishing food
• Take time to pray

Trust in the Lord with all thine heart and lean not unto thine own understanding. In all thy ways acknowledge Him and He shall direct thy paths (Proverbs 3:4).

ABOUT

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ABOUT

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Mission is to gather resources on the WELLNESS approach to health and make these available to individuals to facilitate informed lifestyle choice. The emphasis is on prevention, education and lifestyle management through the rational use of simple, natural remedies for health.

Selection criteria model: The model incorporates the issues of worldview of a health/medical system, the predominance of science, the origin of various therapies, and the importance of recognizing the role of the user as reflexive consumer seeking health information in the information age which is characterized by the need for information for self-care and personal responsibility. More

Evaluating websites: Quality assurance rating tool, Links

Disclaimer: The information presented herein is not intended to diagnose, treat, cure, or prevent disease. If you have any concerns about your own health, you should always consult with your physician.

Webmaster is a Seventh-day Adventist information professional with a doctorate in information science who firmly believes in the health message and wants to provide resources on the WELLNESS approach to facilitate informed lifestyle choice.

Contact

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Please fill out as much of the form as possible. Fields with a * are required.

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*Email Address:

Organization:

Position:

Show Information: Yes ⦿ No ○

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WATER

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• Baths
• Dehydration
• Drinking behavior
• External use
• Hydration

• Hydrotherapy
• Internal use
• Thirst
• Water purification

Water Resources: (showing 1-20 of 200)
Jump to Page: 1 2 3 4 5 6 7 8 9 10

70% of human body is water

Benefits…
• Strengthens the immune system
• Reduces fatigue
• Removes impurities from body
• Improves mental alertness

Tips…
• Start the day with 2 glasses of water
• Drink 8-10 glasses per day
• Avoid soft drinks, coffee and tea

Contrast shower…
• Stimulates circulation
• Strengthens immune system
• Good treatment for colds and flu

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Your choice .... WELLNESS ...

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WATER

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• **Hydrotherapy**

• Baths
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• External use
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• Internal use
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Water Resources: (showing 1-20 of 200)

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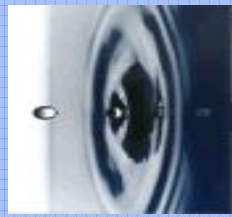• Improves mental alertness

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Contrast shower...

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• Good treatment for colds and flu

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Hydrotherapy Resources: (showing 1-20 of 200)

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1. **Home remedies: hydrotherapy, massage, charcoal ...**

The use of hydrotherapy and other simple means of treating disease are discussed. Those looking for an authoritative source giving the principles of simple remedies especially hydrotherapy will find this resource invaluable.

Resource Details

2.

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•Strengthens immune system
•Good treatment for colds and flu

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Stress management

WATER

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Hydrotherapy Resources: (showing 1-20 of 200)

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1. **Home remedies: hydrotherapy, massage, charcoal ...**
The use of hydrotherapy and other simple means of treating disease are discussed. Those looking for an authoritative source giving the principles of simple remedies especially hydrotherapy will find this resource invaluable.

Resource Details

2.

70% of human body is water

Benefits...
•Strengthens the immune system
•Reduces fatigue
•Removes impurities from body
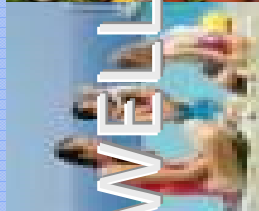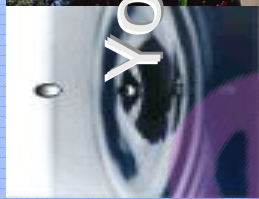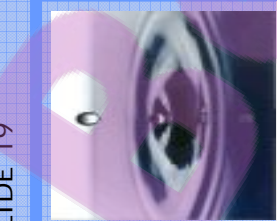•Improves mental alertness

Tips...
•Start the day with 2 glasses of water
•Drink 8-10 glasses per day
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Contrast shower...
•Stimulates circulation
•Strengthens immune system
•Good treatment for colds and flu

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Your choice.... WELLNESS.... Be wise

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Exercise

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Nutrition

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HOME

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Welcome

Wellness....
•Is an active process of becoming aware of and making choices toward a more successful existence (National Wellness Institute 2003)

Health...
•Is psycho-physical wellbeing (WHO 2005)
•Is dependent on what we put into our bodies and what we do with our bodies (Nedley 1998:1)

A marked improvement in health is possible for those who will practice sound principles of healthful living (Heathman & Tillotson 2004)

WELLNESS

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Research data evidences that a lifestyle associated with the consumption of a diet of whole grains, vegetables, nuts, fruits, avoidance of meat and high-fat animal products, moderation in amount of food eaten, abstinence from alcohol and tobacco promotes health and reduces risk of chronic disease substantially (Craig 1999:25)

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SLIDE 23

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ANNEXURE FOUR

HEURISTIC EVALUATION INSTRUMENT

Visibility of system status

☐   Is status feedback provided continuously (e.g. progress indicators or messages)?

Match between system and real world

☐   Are the words, phrases and concepts used familiar to the user?
☐   Does the task sequence parallel the user's work processes?
☐   Is information presented in a simple, natural and logical order?
☐   Is the use of metaphors easily understandable by the user?

User control and freedom

☐   Are facilities provided to "undo" (or "cancel") and "redo" actions?
☐   Are there clearly marked exits (for when the user finds themselves somewhere unexpected)?
☐   Are facilities provided to return to the top level at any stage (e.g. links back to homepage)?

Consistency and standards

☐   Is the use of terminology, controls, graphics and menus consistent throughout the system?
☐   Is there a consistent look and feel to the system interface?
☐   Have colour and style conventions been followed for links (and no other text)?

Error prevention

☐   Is a selection method provided (e.g. from a list) as an alternative to direct entry of information?
☐   Is user confirmation required before carrying out a potentially 'dangerous' action (e.g. deleting something)?

Recognition rather than recall

☐   Are help and instructions visible or easily accessible when needed?
☐   Is the relationship between controls and their actions obvious?

Flexibility and efficiency of use

☐   Does the website allow for a range of user expertise?
☐   Does the website guide novice users sufficiently?
☐   Have unnecessary registrations been avoided?

Aesthetic and minimalist design

- Is the design simple, intuitive, easy to learn and pleasing?
- Is the website free from irrelevant, unnecessary and distracting information?
- Are icons clear and buttons labelled and is the use of graphic controls obvious?
- Have excessive scripts, applets, movies, graphics and images been avoided?

Help users recover from errors

- Do error messages describe problems sufficiently, assist in their diagnosis and suggest ways of recovery in a constructive way?

Help and documentation

- Is help clear and direct and simply expressed in plain English, free from jargon and buzzwords?

Navigation

- Is navigational feedback provided (e.g. showing a user's current and initial states, where they've been and what options they have for where to go)?
- Are any navigational aids provided (e.g. search facilities)?
- Has opening unnecessary new browser windows been avoided?

Structure of information

- Is there a hierarchical organisation of information from general to specific?
- Are related pieces of information clustered together?
- Is the length of a piece of text appropriate to the display size and interaction device?
- Does each screen comprise 1 document on 1 topic with the most important information appearing at the top?
- Has hypertext been used appropriately to structure content?
- Have pages been structured to facilitate scanning by the reader?
- Are the URLs, page titles and headlines straightforward, short and descriptive?

Physical constraints

- Is the distance between targets (e.g. icons) and the size of targets appropriate (size should be proportional to distance)?

Extraordinary users

▫   Is the use of colour restricted appropriately (and suitable for colour-blind users)?

▫   Do the buttons allow for use by older, less agile fingers or people wearing gloves?

▫   Are equivalent alternatives provided for visual and auditory content?

▫   Have accessibility and internationalization guidelines been applied if appropriate?