

TABLE OF CONTENTS

CHAPTER 1	1
ORIENTATION TO THE STUDY	1
1.1 INTRODUCTION.....	1
1.2 BACKGROUND INFORMATION ABOUT THE RESEARCH PROBLEM.....	2
1.2.1 Background to the research problem.....	2
1.2.2 The Global burden of occupational diseases.....	3
1.2.3 Global burden of occupational injuries.....	4
1.2.4 The burden of occupational diseases in South Africa	5
1.3 RESEARCH PROBLEM.....	6
1.4 AIM OF THE STUDY.....	7
1.4.1 Research purpose.....	7
1.4.2 Research objectives	7
1.5 SIGNIFICANCE OF THE STUDY.....	7
1.6 DEFINITIONS OF KEY CONCEPTS AND OPERATIONAL DEFINITIONS	8
1.6.1 Act.....	8
1.6.2 Occupational health	8
1.6.3 Occupational disease	8
1.6.4 Occupational injuries.....	9
1.6.5 Workplace	9
1.6.6 Healthy workplace.....	9
1.6.7 Hazard	9
1.6.8 Risk.....	10
1.6.9 Occupational safety.....	10
1.6.10 Hazardous biological agent	10
1.6.11 Health promotion.....	11
1.6.12 Disease prevention	11
1.6.13 Injury prevention.....	11
1.6.14 Health care workers	11
1.6.15 Public hospital.....	12
1.7 FOUNDATION OF THE STUDY	12
1.7.1 Theoretical framework.....	12
1.7.2 The conceptual framework	13
1.8 RESEARCH DESIGN.....	15
1.8.1 Research paradigm.....	15
1.8.2 Study design	15
1.9 RESEARCH METHODOLOGY	15
1.9.1 The research setting	15

1.9.2	Study population	16
1.9.3	Sampling	16
1.9.3.1	The sample	16
1.9.3.1.1	Sampling of research sites	16
1.9.3.1.2	Sampling of study participants in selected research sites.....	17
1.9.4	Data collection.....	18
1.9.4.1	Data collection process	18
1.9.4.2	Data collection method.....	19
1.9.4.3	Data collection tools	19
1.9.4.3.1	The self-administered questionnaire.....	20
1.9.4.3.2	Part A: Checklist for inspection of OHS policy compliance	20
1.9.4.3.3	Part B: Checklist for review of records on occupational diseases and injuries	21
1.10	SCOPE AND LIMITATIONS OF THE STUDY	21
1.11	STRUCTURE OF THE THESIS	22
1.12	CONCLUSION	22
CHAPTER 2.....		24
LITERATURE REVIEW		24
2.1	INTRODUCTION.....	24
2.2	METHODS	24
2.3	LEGISLATIVE FRAMEWORK ON OCCUPATIONAL HEALTH AND SAFETY:LOCAL AND GLOBAL PERSPECTIVES.....	25
2.3.1	The global perspective	25
2.3.1.1	ILO Decent Work Agenda, 2007-2015.....	25
2.3.1.2	WHO Global Plan of Action on Workers' Health (GPA), 2008-2017.....	25
2.3.1.3	ILO Nursing Convention (C 149) and Recommendation (R 157)	26
2.3.2	The South African perspective	26
2.3.2.1	The National Health Act, 2003 (Act No. 61 of 2003)	27
2.3.2.2	The Occupational Health and Safety Act, 1993 (Act No. 85 of 1993) as amended by The Occupational Health and Safety Amendment Act, 1993 (Act No. 181 of 1993) 27	
2.3.2.2.1	Objectives of the Act	27
2.3.2.2.2	Duties of employers as prescribed by the OHS Act, No. 85 of 1993, as amended..	28
2.3.2.2.3	Duties of employees as prescribed by the OHS Act, No. 85 of 1993, as amended.	28
2.3.2.2.4	OHS appointed structures prescribed by the OHS Act, No. 85 of 1993, as amended.....	28
2.3.2.3	The Regulations for Hazardous Biological Agents, 2001 (R.7233) in terms of OHS Act No. 85 of 1993, as amended	29
2.3.2.4	The Compensation for Occupational Injuries and Diseases Act, 1993 (Act No. 130 of 1993).....	31

2.4	OVERVIEW OF COMMON OCCUPATIONAL HAZARDS IN HEALTH CARE AMONG HCWs	31
2.4.1	Biological hazards in health care workplaces	32
2.4.1.1	Defining biological hazards	32
2.4.1.2	Types of hazardous biological agents (HBA) in health care workplaces	32
2.4.1.3	Transmission of hazardous biological agents (HBA) in health care workplaces.....	32
2.4.1.3.1	Transmission of air-borne HBA in health care workplaces.....	32
2.4.1.3.2	Transmission of blood-borne HBA in health care workplaces	33
2.4.1.4	The challenges of biological hazards among HCWs within the global and South African contexts.....	35
2.4.1.4.1	Challenges of exposure to Mycobacterium Tuberculosis among HCWs.....	35
2.4.1.4.2	The prevalence of Influenza infections among HCWs	37
2.4.1.4.3	The prevalence of exposure to the human immunodeficiency virus (HIV) among HCWs	38
2.4.2.1	Sources of chemical hazards in health care workplaces.....	41
2.4.2.2	Mode of exposures to chemical agents among HCWs	41
2.4.2.3	The effects of chemical hazard exposures on general and reproductive health among HCWs	41
2.4.2.3.1	The effects of chemical hazards on the general health of HCWs.....	41
2.4.2.3.2	The effects of chemical hazards on the reproductive health of HCWs	42
2.4.3	Ergonomic hazards in health care workplaces	43
2.4.3.1	Describing ergonomic hazards in health care workplaces	43
2.4.3.2	Types of ergonomic hazards and their impact among HCWs	43
2.4.3.2.1	The impact of awkward body posture and lifting on the general health of HCWs....	43
2.4.3.2.2	The impact of nursing workload on the general health of HCWs	45
2.4.3.2.3	The effects of ergonomic hazards on the reproductive health of HCWs	45
2.4.4	Physical hazards in health care workplaces and their impact on HCWs	46
2.4.4.1	Defining physical hazards	46
2.4.4.2	Sources of physical hazards in health care workplaces.....	47
2.4.4.3	Slips, trips and falls among HCWs	47
2.4.4.4	The impact of slips, trips and falls (STF) on health care workers	47
2.4.4.4.1	The impact of falls on the general health of HCWs.....	47
2.4.5	Psychosocial hazards in health care workplaces.....	48
2.4.5.1	Defining psychosocial hazards	48
2.4.5.2	Types of psychosocial hazards and their impact on HCWs	48
2.4.5.2.1	The impact of shift work on HCWs	48
2.4.5.2.2	The impact of long hours of work on the health of HCWs	49
2.4.5.2.3	The impact of poor working relationships on HCWs	50

2.4.5.2.4	The impact of poor management practices on HCWs.....	50
2.4.5.2.5	The impact of a shortage of human and material resources on HCWs.....	51
2.4.5.2.6	The impact of an unsafe workplace on HCWs.....	51
2.4.5.2.7	The impact of workplace violence on HCWs	52
2.4.5.2.8	The impact of work-home imbalance on HCWs.....	53
2.4.5.3	Effects of psychosocial hazards on the reproductive health of HCWs	54
2.5	OCCUPATIONAL HEALTH AND SAFETY INTERVENTIONS TO PREVENT OCCUPATIONAL HAZARDS	54
2.5.1	Overview of the hierarchy of controls in occupational health	55
2.5.2	Applying the hierarchies of control to prevent occupational hazards and risks	56
2.5.2.1	Primary prevention of occupational hazards in health care workplaces	56
2.5.2.1.1	Organisational policies	56
2.5.2.1.2	Programmes	56
2.5.2.1.3	Organisational culture	57
2.5.2.1.4	Education and training.....	57
2.5.2.1.5	Medical surveillance	58
2.5.2.1.6	Prophylactic vaccination.....	58
2.5.2.2	Secondary prevention of occupational hazards in health care workplaces	59
2.5.2.2.1	Elimination or substitution	60
2.5.2.2.2	Engineering controls	60
2.5.2.2.3	Administrative controls	61
2.5.2.3	Tertiary prevention of occupational hazards in health care workplaces	68
2.6	CONCLUSION	69
	CHAPTER 3.....	70
	THEORETICAL FRAMEWORK.....	70
3.1	INTRODUCTION.....	70
3.2	THEORETICAL FRAMEWORK OF THE CURRENT STUDY.....	70
3.2.1	Definition of a healthy workplace	71
3.2.2	Components of the WHO Healthy Workplace Framework and Model (WHOHWFM).....	72
3.2.2.1	Avenues of influence for a healthy workplace: the content component.....	72
3.2.2.1.1	The physical work environment.....	73
3.2.2.1.2	The psychosocial work environment.....	78
3.2.2.1.3	Personal health resources in the workplace	80
3.2.2.2	Core principles of a healthy workplace	83
3.2.2.2.1	Stakeholder collaboration.....	84
3.2.2.2.2	Ethics and values	85
3.3	CONCLUSION	86

CHAPTER 4.....	88
RESEARCH METHODOLOGY	88
4.1 INTRODUCTION.....	88
4.2 RESEARCH DESIGN.....	88
4.2.1 Research paradigm.....	88
4.2.2 Research design	89
4.3 RESEARCH METHOD.....	89
4.3.1 The research setting	89
4.3.2 Study population	90
4.3.3 Sampling.....	91
4.3.3.1 Sampling of research sites	91
4.3.3.2 Sampling of participants in selected research sites	92
4.3.3.3 Sample size and sample characteristics.....	93
4.3.4.1 Data collection methods and tools.....	94
4.3.4.1.1 The self-administered questionnaire.....	94
4.3.4.1.2 Part A: Checklist for inspection of OHS policy compliance	96
4.3.4.1.3 Part B: Checklist for review of records on occupational diseases and injuries	97
4.3.4.2 Data collection process	97
4.3.4.2.1 Steps in the data collection process	98
4.3.4.3 Ethical considerations related to data collection	99
4.3.4.3.1 Permission	99
4.3.4.3.2 Informed consent	99
4.3.4.3.3 Confidentiality and anonymity.....	99
4.3.5 Data analysis	100
4.4 INTERNAL AND EXTERNAL VALIDITY OF THE STUDY.....	101
4.4.1 Validity	101
4.4.1.1 Face validity	101
4.4.1.2 Content validity.....	101
4.4.1.3 Design validity	102
4.4.2 Reliability.....	102
4.5 CONCLUSION	102
CHAPTER 5.....	103
ANALYSIS, PRESENTATION AND DISCUSSION OF THE RESEARCH FINDINGS.....	103
5.1 INTRODUCTION.....	103
5.2 RESEARCH RESULTS LAYOUT.....	103
5.3 RESULTS ON DATA FROM QUESTIONNAIRES.....	104
5.3.1 Participants' demographic data	104
5.3.2 Biological hazards	106

5.3.2.1	Factors leading to needle stick injuries as reported by participants	108
5.3.2.2	Factors attributed to negligent disposal of used needles	109
5.3.2.3	Participants' responses regarding factors that led to splashes from patients' infected blood or other body fluids (n=85).....	110
5.3.2.4	Responses of participants regarding improvement of medical waste disposal methods	111
5.3.2.5	Participants' responses on the effects of exposure to hazardous drugs on HCWs	112
5.3.2.6	Responses regarding protection against contamination with infectious agents as provided by the hospital	113
5.3.3	Psychosocial hazards.....	113
5.3.3.1	Participants' descriptions of stressors	115
5.3.3.2	Participants' responses regarding hours worked per week.....	116
5.3.3.3	Participants' responses regarding factors contributing to stressful shift work.....	116
5.3.3.4	Participants' responses regarding shift work that is not well structured to suit their psychological wellbeing.....	117
5.3.3.5	Participants' responses regarding the perpetrator of the violence	118
5.3.3.5.1	Who was the perpetrator of the violence? (n=241)	118
5.3.3.5.2	What was the nature of the violence?.....	118
5.3.4	Work-related injuries and diseases.....	119
5.3.4.1	Participants' responses to work-related injuries and employer intervention	120
5.3.4.2	Participants' responses to types of occupationally acquired diseases and intervention by employer	121
5.3.4.3	Participants' responses on the types of musculoskeletal injuries sustained at work in the past 12 months.....	122
5.3.4.4	Are you on any chronic medication for a work-related injury or disease?.....	123
5.3.5	Medical surveillance	124
5.3.5.1	Responses regarding the types of diseases that participants were screened for upon their appointment	125
5.3.5.2	Participants' periodic medical assessment intervals	126
5.3.6	Workplace safety.....	127
5.3.6.1	Responses regarding who conducted the safety inspections.....	128
5.3.6.2	Participants' responses explaining lack of managerial commitment and support towards OHS for HCWs in the institution (n=297).....	129
5.3.7	The measure of association between participants' demographic factors and biological hazards	130
5.3.7.1	Association between participant's demographics and experiences of a needle stick injury (NSI) at work in the past twelve months.....	131

5.3.7.2	Association between participants' demographics and their experiences regarding negligent disposal of used needles.....	133
5.3.7.3	Association between participants' demographics and their experiences of splashes from patients' infected blood or other body fluids in the past twelve months.....	135
5.3.7.4	Association between participants' demographics factors and constant exposure to biological agents in your unit.....	137
5.3.7.5	Association between participants' demographics factors and constant contact with medical waste	139
5.3.7.6	Association between participants' demographics factors and the effectiveness of medical waste disposal methods used in their organisation.....	141
5.3.7.7	Association between participants' demographic factors and accidental exposure to hazardous drugs	143
5.3.7.8	Association between the participants' demographic factors and experiences of unwanted reactions from the use of latex gloves	145
5.4	PRESENTATION OF PARTICIPANTS' OPEN-ENDED RESPONSES (SELF ADMINISTERED QUESTIONNAIRE).....	147
5.4.1	Contamination with HBAs within the nature and context of patient care delivery ..	148
5.4.1.1	Performance of clinical procedures	148
5.4.1.2	Accidental sharps and needle stick injury (NSI) incidents.....	149
5.4.1.3	Challenges to nurses regarding medical waste disposal	150
5.4.2	The context of occupational injuries and diseases occurrence	151
5.4.2.1	Occupational injuries occurrence	152
5.4.2.2	Occupational diseases occurrence.....	153
5.4.2.3	Management interventions for occupational injuries and diseases	153
5.4.2.4	Chronic treatment related to occupational injuries and diseases	154
5.4.3	The context of workplace safety and OHS policy compliance.....	154
5.4.3.1	Lack of security	154
5.4.3.2	Handling of psychiatric patients.....	155
5.4.3.3	Contagious diseases	155
5.4.3.4	Potential of occupational injuries	155
5.4.3.5	Violence in the workplace.....	156
5.4.3.6	Health screening	157
5.4.3.7	Safety inspections	158
5.4.4	Work-related stressors within the context of psychosocial well-being.....	158
5.4.4.1	Strenuous work engagements.....	158
5.4.4.2	Staff factors.....	160
5.4.4.3	Management factors	161
5.4.4.3.1	Lack of intervention and implementation	163

5.4.4.3.2	Lack of caring.....	164
5.4.4.3.3	Lack of resources.....	164
5.4.4.3.4	Personal health services	164
5.4.4.3.5	Inappropriate placement of pregnant and other sick nurses	165
5.4.4.4	Personal home-work factors.....	166
5.4.4.5	Patient factors	167
5.4.4.6	Work environment.....	167
5.4.5	Addressing the OHS challenges and needs of nurses to promote a good work life	168
5.4.5.1	Improving health measures	168
5.4.5.1.1	Wellness and support.....	168
5.4.5.1.2	Education and training.....	169
5.4.5.1.3	Medical surveillance	170
5.4.5.1.4	Resources and services	170
5.4.5.2	Involving nurses in OHS related decisions	171
5.4.5.2.1	Input and feedback.....	171
5.4.5.3	Addressing workload issues	171
5.4.5.3.1	Placements	171
5.4.5.3.2	Hours of work.....	172
5.4.5.4	Improving safety measures	172
5.4.5.4.1	Equipment and material	172
5.5	RESULTS ON INSPECTION REGARDING THE AVAILABILITY OF AND COMPLIANCE WITH THE OHS POLICY (PART A).....	173
5.5.1	Availability, implementation and compliance with the OHS policy.....	173
5.5.2	Responses regarding training and information dissemination.....	175
5.5.3	Medical surveillance	175
5.5.3.1	Diseases for which employees are periodically vaccinated	176
5.6	PRESENTATION OF DATA FROM INSPECTION CONDUCTED TO ASSESS THE EXISTENCE AND COMPLIANCE WITH THE OHS POLICY (PART A)	177
5.6.1	Health promotion in the context of policies, systems and procedures.....	177
5.6.1.1	Managerial factors.....	178
5.6.1.2	Staff factors.....	178
5.6.1.3	Environmental issues	178
5.6.1.4	Policies and programmes for health and safety promotion	179
5.7	DESCRIPTION OF OHS INJURIES AND DISEASES DATA FROM REVIEWED HOSPITAL RECORDS (PART B).....	180
5.7.1	Nature of occupational diseases	180
5.7.1.1	Occurrence of occupational TB in the period 2011-2014.....	180

5.7.1.2	Summary of occupational disease occurrence in all hospitals during the period 2011-2014.....	181
5.7.2	Types of occupational injuries in all hospitals during the period 2011-2014.....	181
5.7.3	Findings from a review of records on occupational injuries and diseases (2011-2014)	183
5.8	DISCUSSION ON FINDINGS.....	183
5.8.1	Participants' demographic profile	184
5.8.2	Biological hazards	185
5.8.2.1	Association between demographics and experiences of needle stick injury (NSI) in a twelve month period	185
5.8.2.2	Association between participants' demographics and their experiences regarding negligent disposal of used needles.....	185
5.8.2.3	Association between participants' demographic factors and constant exposure to biological agents in a unit.....	186
5.8.2.4	Association between participants' demographic factors and accidental exposure to hazardous drugs	187
5.8.2.5	Association between participants' demographic factors and experiences of unwanted reactions from the use of latex gloves	187
5.8.3	Psychosocial stressors.....	187
5.8.3.1	Increased workload	188
5.8.3.2	Staff absenteeism	189
5.8.3.3	Poor working relations among staff	189
5.8.3.4	Management practices	189
5.8.4	Personal health resources.....	190
5.8.5	Type of work related injuries and diseases.....	190
5.8.6	Factors affecting workplace safety	191
5.8.7	Medical surveillance	191
5.8.8	Findings on availability of OHS policy, implementation and compliance	192
5.9	CONCLUSION	193
	CHAPTER 6.....	194
	SUMMARY, CONCLUSIONS, LIMITATIONS AND RECOMMENDATIONS OF THE STUDY	194
6.1	INTRODUCTION.....	194
6.2	SUMMARY.....	194
6.2.1	Summary of findings	194
6.2.1.1	Findings related to participants' demographic profile	194
6.2.1.2	Findings related to the nature and sources of biological hazards	195
6.2.1.3	Findings related to the nature and sources of psychosocial hazards	195
6.2.1.4	Findings related to the nature and sources of work-related injuries and diseases	196

6.2.1.5	Findings on conducting medical surveillance.....	196
6.2.1.6	Findings on workplace safety	197
6.2.1.7	Findings on the availability of and compliance with the OHS policy at the study sites	197
6.3	RECOMMENDATIONS.....	197
6.4	CONTRIBUTIONS OF THE STUDY.....	199
6.5	LIMITATIONS OF THE STUDY.....	199
6.6	CONCLUDING REMARKS.....	200
CHAPTER 7		201
DEVELOPMENT OF GUIDELINES TO PROMOTE THE HEALTH AND SAFETY OF HEALTH CARE WORKERS IN PUBLIC HOSPITALS IN THE TSHWANE HEALTHCARE DISTRICT OF GAUTENG, SOUTH AFRICA		201
7.1	INTRODUCTION.....	201
7.2	THE PURPOSE OF THE GUIDELINES	201
7.3	SCOPE OF THE GUIDELINES	201
7.4	THE GUIDELINES' DEVELOPMENT AND ALIGNMENT PROCESS.....	202
7.4.1	Rationale for employers to use the WHOHWFM as a basis for OHS promotion ...	202
7.4.2	Requirements for the implementation of the WHOHWFM	203
7.5	IMPLEMENTATION PLAN FOR THE DEVELOPED GUIDELINES.....	227
7.6	EVALUATION OF THE GUIDELINES	227
7.7	IMPLICATIONS FOR HOSPITAL MANAGEMENT.....	228
7.8	IMPLICATIONS FOR THE GOVERNMENT	228
7.9	DISSEMINATION OF THE GUIDELINES.....	229
7.10	CONCLUSION	229
LIST OF REFERENCES		230

LIST OF TABLES

Table 2.1	Classification, description and type of common HBAs responsible for occupational infections among HCWs	30
Table 4.1	Summary of participating hospitals and their bed occupancy	90
Table 4.2	Distribution of sample size per nursing category per hospital.....	93
Table 5.1	Summary of participants' demographic data (n=926).....	105
Table 5.2	Summary of participants' responses on biological hazards (n=926).....	107
Table 5.3	Factors attributed to the negligent disposal of used needles (n=366)	110
Table 5.4	Responses of participants regarding improvement of medical waste disposal methods (n=133)	112
Table 5.5	Responses regarding protection against contamination with infectious agents as provided by the participants (n=75).....	113
Table 5.6	Summary of participants' responses on psychosocial hazards (n=926)	114
Table 5.7	Participants' responses regarding hours worked per week (n=926)	116
Table 5.8	Participants' responses regarding shift work that is not well-structured to suit their psychological wellbeing (n=318)	117
Table 5.9	Participants' responses regarding the nature of the violence (n=241).....	119
Table 5.10	Summary of participants' responses on work-related injuries and diseases (n=926)	120
Table 5.11	Participants' responses to work-related injuries and employer intervention (n=38).....	121
Table 5.12	Participants' responses to types of occupationally acquired diseases and intervention by employer (n=22)	122
Table 5.13	Responses regarding the type of injury/disease that the chronic medication was taken for (n=50)	124
Table 5.14	Participants' periodic medical assessment intervals (n=77)	126
Table 5.15	Summary of responses on workplace safety (n=926)	128
Table 5.16	A summary of association between participants' demographics and experiences of needle stick injury (NSI) at work in the past twelve months (n=926).....	131
Table 5.17	A summary of association between participants' demographics and experiences of negligent disposal of used needles (n=926).....	133
Table 5.18	A summary of association between participants' demographics and experiences of splashes from patients' infected blood or other body fluids in the past twelve months (n=926)	135

Table 5.19	A summary of association between participants' demographics and constant exposure to biological agents in your unit (n=926).....	137
Table 5.20	A summary of association between participants' demographics and constant contact with medical waste (n=926).....	139
Table 5.21	A summary of the association between participants' demographics and the effectiveness of medical waste disposal methods used in their organisation (n=926).....	141
Table 5.22	A summary of the association between participants' demographics and accidental exposure to hazardous drugs in the past twelve months? (n=926)	143
Table 5.23	A summary of the association between participants' demographics and experiences of unwanted reactions from the use of latex gloves in the past twelve months (n=926)	146
Table 5.24	Summary of findings regarding the availability, compliance and implementation of OHS policy (n=8)	173
Table 5.25	Summary of responses based on medical surveillance (n=8)	177
Table 5.26	Distribution of occupational injuries study sites (2011-2014).....	182
Table 5.27	Distribution of occupational injuries and diseases from records reviewed (2011-2014).....	183
Table 7.1	Evidence-based guidelines for the promotion of health and safety for health care workers in the Tshwane Health care District public hospitals	204

LIST OF FIGURES

Figure 2.1	Hierarchy of controls.....	55
Figure 3.1	The WHO Healthy Workplace Framework and Model	71
Figure 3.2	Adaptation of the WHOHWF: Avenues of Influence for a healthy workplace.	73
Figure 3.3	Adaptation of the WHOHWF: Core principles of a healthy workplace	84
Figure 5.1	Factors leading to needle stick injuries as reported by participants (n=76)	109
Figure 5.2	Participants' responses regarding factors that led to splashes from patients' infected blood or other body fluids (n=85).....	110
Figure 5.3	Participants' responses on the effects of exposure to hazardous drugs on HCWs (n=26).....	112
Figure 5.4	Participants' descriptions of stressors (n=625).....	115
Figure 5.5	Participants' responses regarding factors contributing to stressful shift work (n=300).....	117
Figure 5.6	Participants' responses regarding the perpetrator of the violence (n=241).....	118
Figure 5.7	Participants' responses on the types of musculoskeletal injuries sustained at work in the past 12 months (n=139)	123
Figure 5.8	Summary of responses on medical surveillance (n=926).....	125
Figure 5.9	Responses regarding the types of diseases that participants were screened for upon their appointment (n=211).....	126
Figure 5.10	Diseases for which participants were screened upon rotation from one unit to the other (n=24).....	127
Figure 5.11	Distribution of responses regarding who conducted the inspections (n=448) ...	129
Figure 5.12	Participants' responses explaining lack of managerial commitment and support towards OHS for HCWs in the institution (n=297)	130
Figure 5.13	Hospitals' responses based on training and information dissemination (n=8) ..	175
Figure 5.14	Diseases for which HCWs were periodically vaccinated	176
Figure 5.15	Number of nurses with occupational TB in the 8 hospitals during the period 2011-2014	180

LIST OF ANNEXURES

ANNEXURE A	Request to conduct research	254-256
ANNEXURE B	Approval to conduct research.....	257-259
ANNEXURE C	Clearance Certificate from the University of South Africa	260-261
ANNEXURE D	Letter to participants to get verbal permission	262-263
ANNEXURE E	Self-administered questionnaire	264-273
	Part A: Checklist for inspection of OHS policy compliance	274-279
	Part B: Checklist for review of records on occupational diseases and injuries	280-284
ANNEXURE F	Proof-reading and editing certificate.....	285-286

LIST OF ABBREVIATIONS

ASP	Accidental self-prick
CDC	Centre for Disease Control
COIDA	Compensation for Occupational Injuries and Diseases Act
HBA	Hazardous Biological Agents
HBV	Hepatitis B virus
HCV	Hepatitis C virus
HCW	Health care worker
HIV	Human Immunodeficiency Virus
ILO	International Labour Organisation
INH	Isoniazid
MCPHI	Multi-component patient- handling interventions
MDR-TB	Multidrug-resistant TB
MSD	Musculoskeletal disorder
NHA	National Health Act
NIOSH	National Institute of Occupational Safety and Health
NSI	Needlestick injury
OHS	Occupational health and safety
OHS Act	Occupational Health and Safety Act (No. 85 of 1993)
PPE	Personal protective equipment
PTB	Pulmonary Tuberculosis
TB	Tuberculosis
TST	Tuberculin skin test
WHO	World Health Organisation
WHOHWFM	World Health Organisation Healthy Workplace Framework and Model
XDR-TB	Extreme drug-resistant tuberculosis

CHAPTER 1

ORIENTATION TO THE STUDY

1.1 INTRODUCTION

Occupational health and safety (OHS) is the legal science of protecting workers against hazards arising in or from the workplace that can impair the health and well-being of workers, as defined in Manitoba (2012:11). Issues of health and safety in the workplace affect all and sundry, but the feminisation of the workforce (Belin, Zamparutti, Tull & Hernandez 2011:8), has raised awareness about occupational health and safety (OHS) challenges that women workers encounter. This awareness is also accompanied by a need to address risk factors that unique to workers in health care. The goal of occupational health and safety is to ensure, as far as reasonably practicable, that every man and woman in all occupations in any country work in a safe and healthy environment. Health care workers (HCWs) are primarily responsible for enhancing the health of the individuals and populations in various settings (World Health Report 2006:xvii). The task is usually enormous and risky for the HCWs employed in various sectors. Therefore, the occupational health and safety challenges of HCWs, especially HCWs employed in the public health sector, is impacted upon by a variety of occupational hazards and risks, which pose a threat to their physical and psychosocial well-being.

This chapter provides an overview of the study and lays out the processes undertaken. It describes both the background to and the study's research problem. The aim of the study, the study's purpose, hypothesis and objectives of the study and its significance are also outlined in this chapter. Furthermore, the methodology undertaken in the execution of the study is briefly explained in relation to the research design, the population and sampling procedure, data collection steps and tools used, data analysis and validation procedure. Measures to ensure adherence to ethics during the conduct of the study are also highlighted, as well as the scope and limitations of the study.

1.2 BACKGROUND INFORMATION ABOUT THE RESEARCH PROBLEM

1.2.1 Background to the research problem

The health care sector is an industry dominated by female HCWs, who on average, together with their male counterparts, work 40 hours a week, as per the internationally acceptable standards set out in Fleck (2009:4). DollarSense (2010:1) further breaks it down as 91 250 hours worked on average in a life time. Thus, HCWs are exposed to a variety of risks and hazards in the workplace for a long duration of their employment in the health sector, as noted by Gupta (2013:687) that working individuals spend most of their life time at work. Male and female HCWs face similar challenges in the workplace, but for female HCWs, their biological and physiological make-ups increase their vulnerability to the health hazards prevalent in their working environments. It was against this backdrop that the International Labour Organization (ILO) classified women workers as vulnerable workers who need to be protected against harsh labour conditions (Belin et al 2011:18). The feminist movement has also put its weight behind women challenges and has directed its attention to developing, among other things, a theory that explains the “difficulties women face from interacting and working in a society that does not address their unique nature, especially with regards to health and safety needs at work” (Questia 2012:1).

The health care industry is inundated with various potential risks and hazards and thus expose the HCWs to various workplace hazards of a physical, biological, chemical, psychological and social nature (Singh & Matuka 2013:4). They are also likely to suffer various forms of injuries and diseases in their frequent and direct contact with sick patients to who they would be providing nursing care. Literature highlights some of the risks and hazards prevalent in the health sector as including infectious or communicable diseases such as Mycobacterium Tuberculosis (TB), and various forms of musculoskeletal disorders such as back injuries that result from labour intensive activities including lifting or turning heavy patients and lifting heavy materials. Furthermore, psychological challenges, such as stress and psychosomatic disorders, are common among workers in the health care sector. There is, therefore, an increased reporting of the effects of workplace hazards on the health and safety of HCWs in the health care sector (Belin et al 2011:33). Women constitute the majority of workers in the health care industry (Belin et al 2011:31) where occupational hazards such as biological (infections),

chemical (anaesthetic gases, toxic drugs), psychosocial (violence, shift work, night work and burnout); ergonomic (heavy lifting and other musculoskeletal conditions) are prevalent (Burton 2010:84; Belin et al 2011:31). HCWs are also at risk of developing cancer and reproductive problems such as spontaneous abortions (Kopp, Schierl & Nowak 2013:47; Pretty, Connor, Spasojevic, Kurtz, McLaurin, B'Hymer & Debord 2010:24); and anaphylactic reactions (Nagendran, Wicking, Ekbote, Onyekwe & Garvey 2009:271, 272) as a result of exposures to toxic material such as antineoplastic drugs and antiseptic solutions. The HCWs are also prone to musculoskeletal disorders that affect bones, joints, muscles and nerves owing to repetitive movements and carrying heavy weights as cited in (Schoenfisch & Lipscomb 2009:117). Exposure to patients' infected blood and body fluids also puts health care workers at risk of hazardous biological agents (HBAs) such as hepatitis B virus (HBV), hepatitis C virus (HCV), human immunodeficiency virus (HIV) and Tuberculosis (TB) (Karani, Rangiah & Ross 2011:462). Psychological distress can also arise from working under pressure for long and awkward hours with little or no power to bring about change in the work environment (Utriainen & Kyngas 2009:1005).

HCWs in South African public hospitals are no exception to the challenges faced by HCWs globally. In an endeavour to promote decent work, this study addresses occupational health and safety challenges experienced by HCWs in selected public hospitals in the Tshwane health care District of the Gauteng Province, South Africa.

1.2.2 The Global burden of occupational diseases

The global burden of occupational diseases is underestimated due to the under reporting of statistics arising from such occurrences by some countries within the global community (Takala, Hamalainen, Saarela, Yun, Manickam, Jin, Heng, Tjong, Kheng, Lim & Lin 2014:326). Nevertheless, the ILO (2013:4) notes that work-related diseases have been responsible for an estimated 2 million deaths per year (2008), at an average of 5 500 deaths in a day and claiming six times more lives when compared with occupational injuries, whilst 160 000 workers experience non-fatal occupational diseases per annum. Global estimates by Karani et al (2011:462) shows that the hepatitis C virus (HCV) exposure rate to HCWs is at 2.6% and equates to about 16 000 infections; whilst HBV is at 5.9% which is about 66 000 infections; and HIV at 0.5% which amounts to about 200-600 infections among the population of health care workers. Airborne (influenza (H1N1),

tuberculosis (TB), blood borne (hepatitis, human immunodeficiency virus), direct contact infections or oral-faecal infections (diarrhoeal infections such as typhoid) all pose a risk of contagion to health care workers as they handle infected patients on a daily basis as they execute their work (Singh & Matuka 2013:4). The hepatitis C virus (HCV), hepatitis B virus (HBV) and the human immunodeficiency virus (HIV) have been described as blood-borne infections carrying the highest risk of transmission to health care workers (Engelbrecht, Yassi, Spiegel, Van Rensburg, O'Hara, Bryce, Nophale & Rau 2015:23), especially through needle-stick injuries. Other occupationally acquired airborne infections that posed a global challenge to health care workers and caused devastating consequences to workers, their families and the global economy include acute respiratory syndrome (SARS); the 2009 influenza A (H1N1) pandemic (Singh & Matuka 2013:4). West African countries such as Guinea, Liberia and Sierra Leone have experienced the Ebola virus disease (EVD) outbreak in the period January 2014 – March 2015 (WHO 2015:2; Evans, Goldstein & Popova 2015:e439). Two thirds of all infected HCWs succumbed to the disease, 61% were hospitalised cases and 74% non-hospitalised cases (WHO 2015:2). Reported deaths of HCWs (doctors, nurses and midwives) in Guinea were estimated at 1.45% when compared with 0.02% of the total population, whereas Liberia had 8.07% deaths of HCWs compared to 0.11% of the general population. Liberia reported 0.06% population mortality and 6.85% of HCWs mortality (Evans et al 2015:e439).

1.2.3 Global burden of occupational injuries

About 321 000 workers' lives are lost yearly due to occupational accidents, and a further 317 000 non-fatal accidents occur among workers across industries. The yearly rates of work-related injuries among nurses of different categories are estimated to be relatively high (Schoenfisch & Lipscomb 2009:117). Musculoskeletal injuries top the list of injuries in the health care and other industrial and service sectors, with about 538 000 cases reported across all sectors in a one year during the period 2008-2009 (Grobler 2013:210). Drebit, Shajari, Alamgir, Yu and Keen (2010:525) indicated that between 20 and 40% of occupational injuries occur as a result of slips, trips and falls in the health care sector. Injuries among the nurses, have been reported to occur more often in nurses of lower categories than those in higher categories, depending on the type of activity. In lower category nurses, patient lifting and handling accounted for the cause of injury (Rodriguez-Acosta, Richardson, Lipscomb, Chen, Dement, Myers & Loomis 2009:956),

while in high category nurses, injuries were related to needles (Rodriguez-Acosta et al 2009:956).

Therefore, the burden of both occupational injuries and diseases impacts on individual workers. The effects of the injuries and diseases are often severe in cases in the event of the death or permanent injury and disability of the sole breadwinner/s as there will be ripple effect spills to the families and the communities at large that include a decline into impoverishment within families and communities, especially in developing countries, and on a large scale the advent of negative economic development upon countries (ILO 2013:6).

1.2.4 The burden of occupational diseases in South Africa

South Africa has been hit by a quadruple burden of diseases that have had an impact on health care workers, who are the front liners in the provision of care (Department of Health 2014a:8). The burden of communicable diseases mainly concerns HIV, AIDS and TB, while the non-communicable diseases (NCDs) are mainly hypertension, diabetes mellitus and cancers. South Africa has the highest HIV incidence in the world and is among the list of countries over-burdened with the TB incidence, which was at 1000/100 000 population in the year 2012, thus making its HCWs prone to occupational air-borne and blood-borne infections (Engelbrecht et al 2015:23). A 65% TB-HIV co-infection rate among patients was noted in 2012 (Engelbrecht et al 2015:23), which makes HCWs more susceptible to acquiring occupational TB than the general population, as has been confirmed in various studies (Claassens, Sismanidis, Lawrence, Godfrey-Faussett, Ayles, Enarson & Beyers 2010:1578; Health Systems Trust 2013:70). The incidence of multiple drug-resistant (MDR) tuberculosis and extensively drug-resistant (XDR) tuberculosis among HCWs was estimated at 64.8/100 00 against an 11.9/100 000 for the general population; and 7.2/100 000 against 1.1/100 000 for the general population, respectively, thus resulting in more hospitalisation among HCWs than the general population (Engelbrecht et al 2015:23). Consequently, the health care industry in South Africa is viewed as one of the extremely high risk working environments and thus plays a huge role in exposing HCWs to hazards and risks in health care.

1.3 RESEARCH PROBLEM

Health care service work in the South African public health care industry is performed under highly hazardous conditions as a result of the burden of the HIV and AIDS epidemic alongside a high burden of TB; high maternal and child mortality; high levels of violence and injuries; and a growing burden of non-communicable diseases. The situation predisposes HCWs to a high risk of contracting occupational diseases (Department of Health 2012a:13). The risk to HCWs is compounded further by factors such as long hours of work (Kleiner & Pavalko 2010:1467), manual handling of equipment and medical material, the labour intensive nature of their work and musculoskeletal complications associated with the nature of work performed (Schoenfisch & Lipscomb 2009:117), non-existent or inadequate material resources, and poor planning for provision of skilled professionals in public hospitals (Department of Health 2011:20).

There are other health challenges that HCWs encounter in their work experiences. These include the challenges of exposure to a variety of hazardous biological agents (HBAs), as evidenced by about 83 000 HCWs who were infected in the year 2000 (Deuffic-Burban, Delorocque-Astagneau, Abiteboul, Bouvet & Yazdanpanah 2011:5). HCWs endure physical and psychosocially unhealthy (Emergency Nurses Association 2013:1) and unpleasant work environments that are riddled with physical injuries and violence, as well as struggling with a stressful 'work-home life' imbalances. The probable lack of, or ineffective control of hazards (physical, psychological, biological and social) in the workplace, puts health care workers who spend the majority of their life time at work, at risk of exposure to these hazards.

HCWs in the South African public hospitals are no exception in this global condition. The situation warrants an urgent need for the development, implementation and compliance with OHS measures and interventions in response to the health and safety needs of HCWs in the public health sector.

Furthermore, the researcher noted that although work has been done globally on occupational safety and health of HCWs, there is paucity of studies that address the workplace health and safety challenges of HCW's in the South African public hospitals of the Tshwane Health Care District, Gauteng Province.

1.4 AIM OF THE STUDY

The project sought to develop practical guidelines that promote the health and safety of HCWs in South African public hospitals with a view to promoting their well-being in the workplace.

1.4.1 Research purpose

The purpose of this research was to investigate occupational health and safety challenges impacting on HCWs in selected public hospitals in the Gauteng Province of South Africa, and prevailing conditions under which these workers labour. It further sought to investigate patterns of occurrence of occupational diseases and injuries with the intention to recommend and design relevant occupational health and safety guidelines that would be used to promote health and safety among HCWs at selected public hospitals in the Tshwane Health Care District, Gauteng Province.

1.4.2 Research objectives

The objectives of the study were to:

- Describe the socio-demographic characteristics of HCWs in selected public hospitals in the Tshwane Health Care District, Gauteng province.
- Investigate the types of occupational health and safety hazards prevalent among HCWs in selected public hospitals in the Tshwane Health Care District.
- Explore the nature and sources of occupational injuries and diseases reported by HCWs at the study sites.
- Conduct a review of hospital records to assess compliance to occupational health and safety policy in selected public hospitals in the Tshwane Health Care District.
- Develop guidelines to promote occupational health and safety among HCWs at public hospitals in the Tshwane Health Care District.

1.5 SIGNIFICANCE OF THE STUDY

Drawing from the ILO Nursing Personnel Convention, 1977 (C 149), International Labour Office (2005:2), it was envisaged that this study would expose the OHS challenges and

needs of HCWs in the Tshwane Health Care District and propose evidence-based practical guidelines that will assist South African public hospitals to address the challenges and needs of HCWs through:

- Promotion of healthy and safe workplaces for HCWs at the selected Tshwane Health Care District public hospitals.
- Interventions to curb occupational injury and disease occurrence among HCWs at the selected Tshwane public hospitals.
- Augmenting the existing health and safety policy for health workers

1.6 DEFINITIONS OF KEY CONCEPTS AND OPERATIONAL DEFINITIONS

1.6.1 Act

An Act is defined in the *Free Dictionary* (2011) as a formal piece of written law by a legislative body such as Parliament. In this study, an Act refers to the Occupational Health and Safety Act (OHSA), 1993 (Act No. 85 of 1993) as amended by the Occupational Health and Safety Act (OHSA), 1993 (Act No. 181 of 1993).

1.6.2 Occupational health

The National Health Act (NHA), 2003 (Act No. 61 of 2003) defines occupational health as the wellbeing of workers at their workplaces regarding their physical health and safety, and their psychological and social wellbeing (NHA 2003:6), whilst the Occupational Health and Safety Amendment Act, 1993 (Act No. 181 of 1993) further defines occupational health as embracing of occupational hygiene, occupational medicine and biological monitoring, (OHS Act No. 181 of 1993:4). In this study, occupational health refers to the physical and psychological wellbeing of HCWs at public hospitals in the Tshwane Health Care District.

1.6.3 Occupational disease

An occupational disease, as defined by Singh and Matuka (2013:4), is a work-related disease arising from exposure to possible hazards in a work environment.

In the current study, occupational disease refers to a disease that a HCW contracts as a result of exposure to harmful hazards at the Tshwane Health Care District public hospitals.

1.6.4 Occupational injuries

Occupational injuries are defined as those injuries emanating from work related activities happening within hours stipulated as working hours (Al-Thani, El-Menyar, Abdelrahman, Zarour, Consunji, Peralta, Asim, El-Hennawy, Parchani & Latifi 2014:[2]). In the context of this study, occupational injuries refer to work-related injuries sustained by health care workers during their working hours in the Tshwane Health Care District public hospitals, Gauteng Province.

1.6.5 Workplace

A workplace is the area within which an individual performs work that they are employed to do, as cited in Amendment Act, No. 181 of 1993 (OHS Act No 181 of 1993:6). In this study, a workplace refers to the public hospitals wherein HCWs in the Tshwane District Health care are employed to perform their duties.

1.6.6 Healthy workplace

A healthy workplace is defined by Burton (2010:82) as one in which workers and managers work together to foster an atmosphere of protection for the workers and promotion of health and safety; general well-being; and a sustainable work environment.

A healthy workplace in this study means a safe work environment that supports occupational health and safety for HCWs in the selected Tshwane Health Care District's public hospitals.

1.6.7 Hazard

The OHS A hazard is a situation or human practice that exposes a worker to danger as defined in Amendment Act, No. 181 of 1993 OHS (OHS Act No. 181 of 1993:6). In this study, a hazard means any physical, chemical, biological, ergonomic or psychological

danger associated with the nature of work performed by HCWs in the selected Tshwane Health Care District's public hospitals.

1.6.8 Risk

Risk is defined under the Amendment Act, No. 181 of 1993 (OHS Act No. 181 of 1993:5) as the likelihood that a hazard will cause a particular adverse effect in a particular situation in a significant size. In this study, risk means the likelihood that injury (physical, psychological or social) or disease will result from the nature of work performed by HCWs in the Tshwane Health Care District's public hospitals.

1.6.9 Occupational safety

Occupational safety, as defined in the Amendment Act, No. 181 of 1993 (OHS Act No. 181 of 1993:5), is a state of being free from injury or contamination by hazards in the workplace. In this study, it refers to the absence of, or minimal occurrence of physical and psychological injuries that could harm the physical or psychological wellbeing of HCWs in selected public hospitals in the Tshwane Health Care District.

1.6.10 Hazardous biological agent

A hazardous biological agent (HBA) according to the Regulations for Hazardous Biological Agents, 2001 (R.7233) in terms of OHS Act, 1993 (Act No. 85 of 1993) is any disease causing microbes which result in infections, allergy or toxicity, or any form of ill-health affecting workers, (Regulation R7233, 2001, Paragraph 1). HBAs are classified into the following groups: group 1 HA, which has no likelihood of causing human diseases; whereas group 2 HBA causes human diseases and is easily spreads in the community, but is preventable and has treatment. Group 3 HBA causes severe diseases in human beings which are communicable but are preventable, and have a cure available. Group 4 HBA results in severe human diseases which may be communicable, but for which prevention and cure may not be available (Regulation R7233, 2001, Paragraph 1(a)(b)(c)(d)).

A biological agent, in this study, refers to occupational disease causing micro-organisms such as bacteria, viruses and parasites among the HCWs in the selected Tshwane Health Care District's hospitals, which result in occupationally related ill-health.

1.6.11 Health promotion

The World Health Organization (WHO) defines health promotion as the ability of people to improve their health by taking control of issues related to the outcomes of their health (Department of Health 2014a:6). In the current study, health promotion relates to measures instituted at the workplaces to enhance health and safety and ensure the adoption of healthier lifestyles by HCWs in the Tshwane Health Care District's public hospitals.

1.6.12 Disease prevention

Disease prevention pertains to the control of people's, in this case, workers' exposure to HBAs and other hazards at the workplace in order to prevent or reduce the occurrence of occupational diseases (Regulation R7233, 2001, Paragraph 7(a)). Thus, disease prevention, in this study, refers to the measures used to ensure that occurrence of work-related diseases resulting from work-related hazards among HCWs in the Tshwane Health Care District's public hospitals is prevented.

1.6.13 Injury prevention

Injury prevention relates to measures employed in the workplace to maintain a safe working environment regarding work processes, machinery, storage, and reduction of other possible hazards to ensure the safety of workers, according to Act, No. 85 of 1993 (OHS Act No. 85 of 1993:8) as amended. In this study, therefore, injury prevention pertains to the control of workplace hazards to prevent the occurrence of injuries among HCWs in the Tshwane Health Care District's public hospitals.

1.6.14 Health care workers

According to the (ILO 2010:4) health care workers (HCWs) are persons engaged with direct patient care in public or private health care settings. In this study, HCWs refer to

nurses of all nursing categories employed at the Tshwane Health Care District's public hospitals, Gauteng Province during the time of the research to this study.

1.6.15 Public hospital

Regulations Relating to Categories of Hospitals, 2012 (R185) in terms of the National Health Act (NHA), 2003 (Act No. 61 of 2003), define a public hospital as a state owned entity which has a role of caring for sick people. Public hospitals are classified according to the three-tier levels of health care delivery as tertiary (including academic and central), regional and district (Regulation R185, 2012, Paragraph 2(a)(c)(d)). In this study, a public hospital refers to a government run hospital at the level of an academic (including central and tertiary), regional and district in the Tshwane Health Care District's public hospitals.

1.7 FOUNDATION OF THE STUDY

1.7.1 Theoretical framework

The theoretical base of this study is grounded upon the WHO Healthy Workplace Framework and Model as outlined by Burton (2010:82), which is primarily and scientifically designed as a guide for employers and employees to jointly promote healthy and safe workplaces. The framework provides a view that the physical and the psychosocial condition of the work environments should be continuously healthy and safe for the general wellbeing of the workers, and furthermore workers should be provided with resources to promote their personal health, as noted by Burton (2010:1).

The framework covers a variety of industries and workplaces and is thus adopted to as a guide for this study. The framework is not gender specific, but its concepts, content and principles are referred to, in order to guide the coining and development of guidelines for this research. The content and principles are highlighted in the WHO Healthy Workplace Model as:

Content (four avenues of influence)

The four avenues of influence in the WHO Healthy Workplace Framework and Model (WHOHWF) are the (i) physical work environment; (ii) psychosocial work environment; (iii) personal health resources; and (iv) enterprise community involvement, and how they impact on the wellbeing of workers, as outlined by Burton (2010:83). This study, however, draws on the first three avenues of influence due to their relevance to the study's focus.

Core principles

The core principles identified in the WHO Healthy Workplace Framework and Model (WHOHWF) are leadership, workers and ethics. The relationship between the principles is that ethics form the foundation on which to base the relationship between leadership and the workers. The relationship is crucial for collaborative effort that endeavours to achieve workplace health and safety for workers and thus benefit the organisation (Burton 2010:97).

1.7.2 The conceptual framework

Health and safety in any area of work is not purely based on sustaining an injury or contracting an infection, it goes beyond the physical aspect and affects the psychological wellbeing of employees. The creation of a safe and healthy work environment that seeks to protect and promote the well-being of HCWs, requires an incorporation of all components that influence a work environment, termed by Burton (2010:83) as the 'avenues of influence'. The four avenues of influence aid in forming and enhancing collaboration between workers and organisations. These four avenues, as pointed out by Burton (2010:83), are: (i) the physical work environment; (ii) psychosocial work environment; and (iii) personal health resources in the workplace. The avenues form the core of this study and are outlined as follows:

The physical work environment

The physical work environment is that part of the work environment that we connect with through our senses, such as the equipment; materials, building, air, chemicals, agents and processes, which can have an effect on the well-being of the workers. Burton

(2010:84) goes on further to cite examples of hazards in the physical work environment as:

- Physical hazards (e.g., radiation, extreme temperatures)
- Biological hazards (e.g., hepatitis B, HIV, pandemic threats, hepatitis C)
- Chemical hazards (e.g. solvents, solutions)

The psychosocial work environment

This, as outlined by Burton (2010:85), addresses aspects such as work organisation, workers' beliefs and values, the organisational culture, and the attitudes and organisational practices that have an effect on workers' well-being. Examples of psychosocial hazards that have been cited in Burton (2010:85) as:

- Poor work organisation (workloads, poor communication, job training)
- Organisational culture (lack of policies in relation to respect or dignity of workers, and lack of support for healthy lifestyles)
- Issues of shift work
- Lack of support and protection for worker rights (hours of work, maternity issues, occupational health and safety rights)

Personal health resources in the workplace

Personal health resources pertain to the support that the institution gives to its workers with regard to information, health services and any form of assistance seeking to enhance workers' attempts at improving and maintaining healthy personal life practices (Burton 2010:86). The following were cited (Burton 2010:86) as examples:

- Poor quality of sleep (due to workplace stress, workloads or shift work).
- Lack of knowledge of available resources.



1.8 RESEARCH DESIGN

1.8.1 Research paradigm

A paradigm is defined as a framework of assumptions through which quantitative or qualitative scientists view their world, truth or research. This study made use of the quantitative research approach, which, according to Fain (2013:215), utilises numbers to epitomise realism.

1.8.2 Study design

Brown (2014:20) defines a study design as a guide or outline of how the study should be conducted, with broad assumptions being scaled down to a detailed methodology in order to have maximum control over variables that may interfere with the desired findings of the study. A descriptive cross-sectional survey study design (Jolley 2013:95), was used to conduct the research for this study. The descriptive aspects of the project were geared towards gathering data to describe the actual prevailing situation regarding occupational health and safety challenges of health care workers in the selected public hospitals.

1.9 RESEARCH METHODOLOGY

Brown (2012:32) states that a research methodology refers to the overall steps, procedures, arrangements and mechanics of a given study.

1.9.1 The research setting

A setting, as explained by LoBiondo-Wood and Haber (2014:101), is the area where participant recruitment and research data collection takes place. The research was conducted in eight public hospitals in the Tshwane Health Care District, Gauteng Province of South Africa. The hospitals were categorised as five (5) district, one (1) regional and two (2) central hospitals. Tertiary, academic and central hospitals were all grouped and categorised as central hospitals. Hence, the actual hospitals that were selected for inclusion in the study were Steve Biko Academic, Dr George Mukhari Academic, Kalafong, Pretoria West, Tshwane district, Jubilee, Mamelodi and Odi hospitals.

1.9.2 Study population

Grove, Burns and Gray (2013:351) describe a study population as derived from a target population and state further that it is from this population that a sample is derived. The current research's study population comprised of 2000 HCWs present on the research days, and on whom occupational health and safety challenges in the public hospitals in Tshwane health care district were investigated. The Tshwane healthcare district comprised of ninety (90) health care facilities, i.e. three-tier hospitals, specialized hospitals, community health centres (CHCs), clinics, maternal and obstetric units (MOUs).

1.9.3 Sampling

The study made use of the two-stage sampling, where the purposive sampling was applied to select 3-tier public hospitals located in the Tshwane health care district, to participate in the study. The second stage involved census sampling of participants in the research sites, as described hereunder:

1.9.3.1 The sample

1.9.3.1.1 Sampling of research sites

Tshwane had eight public hospitals listed in its three-tier system of health care delivery. Eight (8) hospitals were those falling under the central, regional and district level hospitals. The study made use of a purposive sampling of eight (8) public hospitals falling within the 3-tier levels, namely: Dr George Mukhari and Steve Biko Academic Hospitals; Kalafong Regional Hospital and Odi, Tshwane, Jubilee, Mamelodi and Pretoria West District hospitals. All eight 3-tier hospitals were invited to participate in the study to ensure representation and to avoid selection bias.

(i) Inclusion criteria

Inclusion criteria are particular characteristics that make elements within the population suitable for selection in a study sample (LoBiondo-Wood & Haber 2014:233). Included in this study were public hospitals in the Tshwane health care district classified under the 3-tier levels, i.e. district, regional and central hospitals. Selected public hospitals were included based on a range of health services they provided, i.e. from basic to highly complex medical and surgical procedures, and their high bed occupancy.

(ii) Exclusion criteria

Lack of specific characteristics by elements in the population cause them not eligible for selection in a study sample, is referred to as exclusion criteria (Grove, Gray & Burns 2015:251). The exclusion criteria for this study applied to health facilities that were not classified under three-tier hospitals, for example, community health centres (CHCs) and clinics. Excluded as well were specialised public hospitals such as Hospice, psychiatric and TB hospitals, all other hospitals outside Tshwane, and private hospitals in and outside the Tshwane health care district.

1.9.3.1.2 Sampling of study participants in selected research sites

Purposive sampling is a non-probability sampling technique where decisions pertaining to participants who should take part in the study are left to the researcher's judgement (Gerrish & Lathlean 2015:181). Firstly, the purposive sample consisted of HCWs who belonged to the nursing profession within various nursing categories (Brown 2014:80). Nurses were specifically selected from the entire population of HCWs as a source of data, to participate in the in the eight (8) Tshwane health care district public hospitals. Secondly, census sampling of nurses who were on duty on the particular day of research in a particular hospital, was used to invite all nurses to participate in the study. A total of 2000 nurses were on duty in eight (8) targeted hospitals, and were all invited to participate in the study, and of these, 926 volunteered to participate in the study.

(i) Inclusion criteria

HCWs belonging to the nursing profession were eligible to participate in the study, and all nursing categories were qualified to partake in the research as well. Only nurses who were on duty on the particular day of research in the respective research sites in the Tshwane health care district were eligible for inclusion in the study. All hospital units in selected hospitals were eligible to take part.

(ii) Exclusion criteria

Excluded were nurses who were not on duty on the particular day of data collection in eight (8) research sites in the Tshwane health care district.

1.9.4 Data collection

Research requires a precise and systematic process of realising the subjects and collecting the required and relevant information. The information should be aligned to the research objectives, the purpose, questions or hypothesis, according to Grove et al (2015:502).

1.9.4.1 Data collection process

Firstly, permission was sought and granted by relevant authorities: The University of South Africa Health Studies Higher Degrees Committee; the Department of Health Gauteng Province Research and Ethics Committee; and the Tshwane Health Care District office. The data collection process was divided into three steps.

(i) Step one

Phase one of the data collection took place on the first day and involved the distribution of a self-administered questionnaire to 2000 nurses in all categories at all central (central, academic and tertiary grouped as one), regional and district public selected hospitals in the Tshwane Health Care District. The researcher briefed the participants about the purpose and benefits of the study, and obtained informed consent. Two assistants helped out with the distribution of questionnaires. Filled-in questionnaires were put in sealed

envelopes and locked up by the unit manager until collection by the researcher the following day. Each hospital was allocated three days for research, and specific but different dates were allocated per hospital. The first day was for the distribution of self-administered questionnaires to eligible participants in the selected public hospitals.

(ii) Step two

On the second day the researcher and two assistants collected the filled-in questionnaires in order to avoid nurses who were off duty or on leave on the data collection day, to access and fill in questionnaires. Nurse managers in respective hospitals were requested to prepare for review of OHS documents on the third day.

(iii) Step three

Phase three was implemented on the third day of research per hospital per time. The researcher worked with the occupational health nurse (OHN) in each hospital. A self-administered structured checklist (Part A) was provided to the OHN to assess the existence, compliance and implementation of occupational health policies per hospital. Evidence of records was shown to the researcher to verify the responses provided by the OHN in the checklist. In summary, all three steps were undertaken per hospital per time and the data collection process took a period of six months, i.e. from March 2014 – August 2014.

1.9.4.2 Data collection method

A survey method that used a self-administered questionnaire was employed, as the sample was large (Brown 2014:82), to collect self-reported data from nurses at the selected public hospitals. Two more data collection instruments i.e. checklist one and checklist two, were used to review hospital records for OHS compliance and for incidences of diseases and injuries.

1.9.4.3 Data collection tools

A questionnaire is a data collection tool which is uniform, constructed ahead of data collection and is predetermined, and cannot be changed once the data collection has

started (Parahoo 2014:48). In this study, self-administered questionnaires for individual participants were used, while two structured checklists were used to review hospital records. Both data collection tools are described below.

1.9.4.3.1 The self-administered questionnaire

The questionnaire comprised of closed and open-ended questions. A 'yes' or 'no' response was required from the participants when filling in the questionnaire. However, some of the 'yes' or 'no' responses required more clarity, and as such the participants had to give open-ended responses. The questionnaire was subdivided into the following subsections:

- Demographic data
- Exposure to workplace hazards
- Work-related injuries/diseases
- Medical surveillance
- Workplace safety
- Worker perspectives on health and safety promotion

1.9.4.3.2 Part A: Checklist for inspection of OHS policy compliance

This part of the questionnaire comprised of items that sought to check the presence of policies, implementation and communication of programmes and policies. The checklist had closed and open-ended questions to elicit clarity of responses. The checklist was completed by the Occupational Health Nurse and the sub-sections thereof were as follows:

- Demographic data
- Policy existence, compliance and implementation
- Training and information dissemination
- Medical Surveillance
- Health and safety initiatives

1.9.4.3.3 Part B: Checklist for review of records on occupational diseases and injuries

This checklist was used to assess the occurrence of occupational diseases and occupational injuries among HCWs. The data tool was designed in a manner fit to assess for the occurrence of the diseases and injuries in the three-year period prior to the date of research, and the following were the sub-divisions of the checklist:

- Demographic data
- Occurrence of occupational diseases
- Occurrence of occupational injuries

1.9.5 Data analysis

In Grove et al (2015:47), data analysis is defined as a process of organising and synthesising all data that has been collected. All quantitative data was analysed using the statistical computations of the SAS, Release 9.2 software, running under Microsoft Windows for a personal computer, and in accordance with the advice of the statistician. Open-ended data arising from open-ended responses of the participants were quantified, coded and categorised (Brown 2012:44). Narratives emanating from the participants' open-ended responses were formulated. Data from hospital records, policy reviews and open-ended- questions were also analysed statistically and presented in a narrative.

1.10 SCOPE AND LIMITATIONS OF THE STUDY

Tshwane health care district in the Gauteng Province has (90) listed public health facilities, and this study was based in eight public hospitals, which has an effect on the generalisability of the results to the rest of the province and nationally. Furthermore, only female nurses responded in the study, which also affects generalisation to the male HCWs. The existence of incomplete and unstandardized OHS records was another challenge encountered by the researcher, and is related to the study design's retrospective record review.

1.11 STRUCTURE OF THE THESIS

Chapter 1 provides a general outline of the study and defines the research problem, purpose, objectives and methodology undertaken.

Chapter 2 is a literature review on occupational health and safety among health care workers.

Chapter 3 discusses the WHO Healthy Workplace Framework and Model which has been adopted as the theoretical and conceptual foundation of the study.

Chapter 4 outline the specific methodology used in this study and aspects of sampling, data collection, data analysis and the reliability, validity and ethical issues thereof. It also describes the scope and limitations of the study.

Chapter 5 focuses on the analysed data, presents the research findings and ends with a discussion on the findings.

Chapter 6 presents the concluding remarks about the study, lessons learned, and recommendations from the research and an outline of possible future studies.

Chapter 7 outlines the proposed guidelines for use in public hospitals in effort to promote the occupational health and safety of HCWs.

1.12 CONCLUSION

This chapter laid the foundation for this research project as it outlined the introductory and background information about the study and stated the problem statement of the research. The drive of the study was explained through the aim, purpose and significance of the research. The research objectives were outlined, and operational definitions used in the study were provided together with the abbreviations for a better understanding of concepts as intended. The theoretical and conceptual basis of the study was explained using the WHO Healthy Workplace Framework and Model (Burton 2010:1). Elements of the research design, methodology and analysis used in the study are described as well. The chapter concluded with a discussion of the validity and reliability issues affecting the

study, the considered research ethical issues and the scope and limitations to the research.

The next chapter reviews relevant literature and prior studies conducted on occupational health and safety hazards and risks, and on ways to curb the occurrence of occupational mishaps, in an attempt to promote health and safety for HCWs in the workplace.

CHAPTER 2

LITERATURE REVIEW

2.1 INTRODUCTION

This chapter outlines the review and synthesis of several international and local research studies on occupational health issues impacting on the health and safety of health care workers (HCWs). The chapter begins with a brief overview of the global legislative framework on occupational health and then that within the South African context; followed by that of occupational risks and hazards common in health care settings. Further outlined here is the nature and sources of various occupational diseases and occupational injuries that are common among health care workers, as well as the preventive measures that can be used to minimise and control exposures to work in hazardous health care settings.

2.2 METHODS

A document search method, using various internet search engines, was used to identify and gather relevant studies and reports from international agencies such as the World Health Organization (WHO) and the International Labour Organization (ILO). The library was consulted to access research books, journals, Acts and Government reports, and scientific journal articles. The search included both local and international literature on occupational health and safety among (HCWs). The researcher reviewed the gathered documents and here the review considered areas such as the legislative framework, occupational hazards in health care settings, occupational diseases and injuries among HCWs, as well as preventive and control measures that can be used to combat workplace hazards in health care settings.



2.3 LEGISLATIVE FRAMEWORK ON OCCUPATIONAL HEALTH AND SAFETY: LOCAL AND GLOBAL PERSPECTIVES

2.3.1 The global perspective

This section provides an overview of international declarations and conventions that are applicable to occupational health and safety (OHS) in the health care sector.

2.3.1.1 ILO Decent Work Agenda, 2007-2015

The International Labour Organization (ILO) set international standards to promote the “*Decent Work Agenda*” which aims to promote decent (healthy and safe) and productive work for women and men in conditions of freedom, equity, security and human dignity (ILO 2007:13). The implementation of legal labour protection by States seeks to ensure that the safety and health protection of workers is achieved against unsafe working environments (ILO 2008:1). The Seoul Declaration, signed by the ILO, the International Social Security Association (ISSA) and the Korea Occupational Safety and Health Agency (KOSHA) at the XVIII World Congress held in Korea in 2008, underlined the international community’s commitment to upholding and respecting employees’ right to a safe and healthy work environment (ILO 2008:1). Furthermore, it is important to reinforce that health and safety at work should continuously raise awareness of occupational safety in order to promote decent work for all workers (ILO 2007:26).

2.3.1.2 WHO Global Plan of Action on Workers’ Health (GPA), 2008-2017

The WHO Global Plan of Action on Workers’ Health (GPA), 2008-2017, was put in place to address the occupational health needs of workers using the Primary Health Care (PHC) approach that includes the primary, secondary and tertiary prevention interventions (GOHNET 2013:6). The primary level prevention measures include the improvement of working conditions to eliminate occupational hazards and risks, engaging in awareness promotion and information dissemination, and the promotion of site inspections and worker training (GOHNET 2013:6). The secondary prevention measures are geared towards early identification and referral of occupational diseases and injuries, together with reporting, treating and rehabilitating workers (GOHNET 2013:6). Finally, tertiary prevention is intended at enhancing working capacity, encouraging an early return to

work, and trying to reduce absence due to sickness (GOHNET 2013:6). The PHC approach is achievable but can only do so through policy development and implementation, especially in the local South African fraternity and other developing countries.

2.3.1.3 ILO Nursing Convention (C 149) and Recommendation (R 157)

The goal of the ILO Nursing Convention (C 149) is to ensure that conditions of work for HCWs are decent, secure and ensure dignity (International Labour Office 2005:2). Such conditions include the provision of maternity leave, an 8-hour work day and the provision of occupational safety (International Labour Office 2005:2). The ILO Nursing Convention (C 149), in the International Labour Office (2005:3), underscores that nurses' work environment and working conditions should be guarded through State legislative provisions. The Convention also made recommendations regarding the regulation of working hours for nurses. These include: nurses should not be subjected to extremely long hours at work, with the suggestion that hours and shift work should be in line with those of other workers across industries, as regulated by law in each country (International Labour Office 2005:15), and that nurses should be provided with meal and rest breaks within a normal work day, and the breaks should be reasonably sufficient (International Labour Office 2005:15) to ensure enough rest periods. In addition, the Maternity Protection Convention (1952) and the Maternity Protection Recommendation (1952) states that nurses would be assured of maternity benefits without loss of employment or remuneration (International Labour Office 2005:16). Finally, member states of the Convention Treaty are bound by the Occupational Health Services Recommendation (1959) which seeks to ensure that occupational health services are accessible to workers.

2.3.2 The South African perspective

This section provides an overview of South African legislation applicable to occupational health and safety issues affecting workers across industries and including the health care sector. An overview of OHS legislation provides a reference basis for the reader and indicates that conforming to legislative prescripts and a proper implementation of policy promotes employee well-being.

2.3.2.1 The National Health Act, 2003 (Act No. 61 of 2003)

The obligations of the employer are stipulated in The National Health Act (NHA), 2003 (Act No. 61 of 2003). As one of its objectives, the NHA, 2003 is geared towards the regulation and provision of rights and duties of health care workers (HCWs), among other stakeholders (NHA 2003:10). These rights are enshrined by the NHA of 2003 in section 20, particularly subsections (3) and (4) where it is stated categorically that HCWs should be provided with a workplace that has a minimum injury and disease transmission rate, and does not tolerate the verbal or physical abuse of the workers by the health facility users (NHA 2003:17).

2.3.2.2 The Occupational Health and Safety Act, 1993 (Act No. 85 of 1993) as amended by The Occupational Health and Safety Amendment Act, 1993 (Act No. 181 of 1993)

The Occupational Health and Safety Act (OHSA), 1993 (Act No. 85 of 1993), as amended by the Occupational Health and Safety Act, 1993 (Act No. 181 of 1993) states that the employer, as the legal custodian of occupational health and safety (OHS), has a responsibility to bring about and maintain as far as reasonably workable, a work environment that is safe and without risk to the health and safety of the workers (OHS Act No. 85 1993:3).

2.3.2.2.1 Objectives of the Act

The OHS Act, No 85 of 1993, as amended lays out its objectives as:

“to provide for the health and safety of persons at work and for the health and safety of persons in connection with the use of plant and machinery; the protection of persons other than persons at work against hazards to health and safety arising out of or in connection with the activities of persons at work; to establish an advisory council for occupational health and safety; and to provide for matters connected therewith” (OHS Act No. 85 of 1993:1), as amended.

2.3.2.2.2 Duties of employers as prescribed by the OHS Act, No. 85 of 1993, as amended

Section 7 of the OHS Act No. 85 of 1993 mandates workplaces to have a written OHS policy for employees, that has the signature of the head of the institution and that this policy should be displayed for all to see (OHS Act No. 85 of 1993:8). Hypothetically it would be reasonable for an employee to expect to work in a safe work environment during the performance of duties assigned by the employer. The employer is obligated to provide such an environment through the provision of safe and good working machines; safe systems of work; elimination or reduction of hazards and risks during and beyond work processes; supply of personal protective equipment (PPE); and identification of all hazards, articles and substances produced in relation to all work processes, according to the amended Act, No. 85 of 1993 (OHS Act No. 85 of 1993:8). These measures are required to design preventative actions to curb unsafe practices and promote the wellbeing of workers; make public OHS related information, provide OHS training and supervision; and in ensuring that the requirements of the OHS Act and policies are adhered to by all and sundry, Act, No. 85 of 1993, as amended (OHS Act No. 85 of 1993:4).

2.3.2.2.3 Duties of employees as prescribed by the OHS Act, No. 85 of 1993, as amended

Section 14 of the Act states that employees need to take responsibility for their health and safety, and of those around them (OHS Act No. 85 of 1993:10), by acting responsibly and reporting any situation around them which may pose a danger to themselves or other employees. Employees have a duty to comply with the provisions of the OHS Act, No. 85 of 1993, as amended. Section 37 of the Act states further that, anyone who engages in acts of commission or omission may be in contravention of the Act, and may be held liable for such offences (OHS Act No. 85 of 1993:21).

2.3.2.2.4 OHS appointed structures prescribed by the OHS Act, No. 85 of 1993, as amended

Sections 17 and 19 of the Act, stipulate that it is mandatory for employers to have structures such as the OHS committee and OHS representatives in the workplace, as per the amended Act, No. 85 of 1993 (OHS Act No. 85 of 1993:5, 6). These structures are

required to oversee the issues of safety in the workplace, Act, No. 85 of 1993, as amended (OHS Act No. 85 of 1993:5, 6), and to collaborate with employers on matters of health and safety of workers. Thus, health and safety representatives should review health and safety measures; conduct site visits; identify hazards; and attend any form of investigation or inquiry as stated in sections 18 (1) & (2) of OHS Act according to the Act, No. 85 of 1993, as amended (OHS Act No. 85 of 1993:5, 6). The health and safety committee should also collaborate with the employer; make appropriate recorded recommendations to the employer; and hold regular meetings to discuss the promotion of worker health and safety after reports of relevant incidences, in accordance with Act, No. 85 of 1993, as amended (OHS Act No. 85 of 1993:6).

2.3.2.3 The Regulations for Hazardous Biological Agents, 2001 (R.7233) in terms of OHS Act No. 85 of 1993, as amended

The Regulations for Hazardous Biological Agents (HBA), 2001 (R.7233) in terms of OHS Act No. 85 of 1993, as amended, defines a biological agent as an organism that may be hazardous to human beings and result in infections, toxicity or allergies as states in the amended Act, No. 85 of 1993 (OHS Act No. 85 of 1993:1). Hazardous biological agents (HBA) that are prevalent among HCWs and give rise to common occupational illnesses are captured in a tabular form in table 2.1 as per classification, description and type of biological agent as cited in the Regulations for Hazardous Biological Agents (HBA), 2001 (R.7233) in terms of amended Act, No. 85 of 1993 (OHS Act No.85 of 1993:27, 28, 29).

Table 2.1: Classification, description and type of common HBAs responsible for occupational infections among HCWs

Classification of HBA	Description	Types and examples of common hazardous biological agents causing occupational diseases among health care workers HCWs	
		Bacteria	Viruses
Group I HBA	HBA that are less likely to cause disease in humans.		
Group 2 HBA	HBA that cause severe diseases in humans, and although prophylaxis and treatment for such diseases are available, they are less likely to be transmitted outside of health care facilities.		Influenza types A, B and C2 Measles
Group 3 HBA	HBA that cause severe diseases in humans, and although there exists prophylaxis and treatment for such diseases, they are likely to be spread to the community.	Mycobacterium tuberculosis	Hepatitis C Hepatitis B Human immunodeficiency viruses
Group 4 HBA	HBA that cause severe human illness as well, but unlike groups 2 and 3, there is no effective treatment and no prophylaxis for these diseases.		Ebola virus

The Regulations for Hazardous Biological Agents (HBA), 2001 (R.7233) in terms of OHS Act, 1993 (Act No. 85 of 1993), as amended, stipulate that employee possibility of exposure to HBA needs to be communicated to the employer (Regulation R7233, 2001, Paragraph 5(2)), and that the monitoring of employees' health is an employer obligation, according to the Amendment Act, No. 181 of 1993 (OHS Act No. 181 of 1993:4). Furthermore, employers need to conduct risk assessments in their workplaces with regard to the HBA that their employees may be exposed to, including the area of exposure, duration of exposure and the impact of the HBA on the health of the employees. This assessment should be undertaken on a two-year periodical interval, as per Act, No. 85 of 1993 (OHS Act No. 85 of 1993:8) as amended. It is a requirement that employees should be provided with regular medical surveillance to ascertain the effects of HBA on their health. This should be done upon employment, and thereafter surveillance should be conducted periodically, according to a written protocol of the institution, Act, No.85 of

1993 (OHS Act No. 85 of 1993:9, 10), as amended. This requirement is found in the OHS Act 85 of 1993, as amended.

2.3.2.4 The Compensation for Occupational Injuries and Diseases Act, 1993 (Act No. 130 of 1993)

The objective of this Act is to compensate workers who either get ill, injured or die due to occupational diseases contracted or injuries sustained during their course of duty (COIDA 1993:2).

The Act makes provision, in subsections 22 and 65 of the Act (COIDA 1993:65), to recompensate those workers who end up with temporary or permanent dysfunctionality as a result of the injuries and diseases.

Section 38 (1) of the COIDA, 1993, requires that the employee or someone on their behalf should immediately report any injury to the employer, and that the employer should also report to the compensation commissioner any injury sustained by an employee, on behalf of the injured employee (COIDA 1993:21).

2.4 OVERVIEW OF COMMON OCCUPATIONAL HAZARDS IN HEALTH CARE AMONG HCWs

This section briefly outlines the hazards and the challenges faced by HCWs, emanating from, and cutting across all types of hazards. The focus is on OHS challenges that are posed by exposure to infectious diseases, work organisation, workplace violence, pregnancy, managerial and human resources among HCWs, which impact on the health of HCWs.

Occupational health and safety challenges, within health care workplaces, emanate from various occupational hazards that pose various threat to the health of workers in health care settings. These are physical, biological, chemical, ergonomic and psychosocial hazards as discussed below.

2.4.1 Biological hazards in health care workplaces

2.4.1.1 Defining biological hazards

Biological hazards emanate from hazardous biological agents (HBA) which are defined as causative agents for occupational diseases in the health care workplace (McDiarmid 2014:316). The Regulations for Hazardous Biological Agents, 2001 (R7233) in terms of OHS Act 85 of 1993 as amended, defines HBA as any disease causing microbes which result in infections, allergy or toxicity, or any form of ill-health that affects workers (Act, No. 85 of 1993 (OHS Act No. 85 of 1993:3).

2.4.1.2 Types of hazardous biological agents (HBA) in health care workplaces

Various HBA exist in health care workplaces in the form of bacteria, fungi, viruses or parasites as some of the disease causing agents (McDiarmid 2014:316; Rim & Lim 2014:43), and these can be air-borne or blood-borne. About a hundred and twenty-six (126) viruses have been cited in Deuffic-Burban et al (2011:5) as responsible for causing occupational diseases in health care settings. The examples of common occupational HBA prevalent among HCWs, for which an overview is provided for the purpose of this study are:(bacteria) Mycobacterium Tuberculosis, (viruses) Hepatitis B (HBV), hepatitis C (HCV), the human immunodeficiency virus (HIV) and influenza viruses (e.g. H1N1).

2.4.1.3 Transmission of hazardous biological agents (HBA) in health care workplaces

Bacteria and viruses may be transmitted via airborne spread, through contaminated body secretions/fluids, needle-stick injuries, or direct physical contact with an infected source (Deuffic-Burban et al 2011:5).

2.4.1.3.1 Transmission of air-borne HBA in health care workplaces

Airborne HBA include particles, in the form of droplets suspended in the air called bio-aerosols, which are common in health care settings in the form of viruses, bacteria, endotoxin or fungi (Rim & Lim 2014:43). The tubercle bacillus that causes tuberculosis

(TB) and influenza viruses are examples of common air-borne HBA that are common in health care workplaces (McDiarmid 2014:317; Sydnor & Perl 2011:154).

Tubercle bacillus, on the one hand, is some small droplet nuclei that is transmitted air-borne from person to person to cause *Mycobacterium tuberculosis* (Sydnor and Perl 2011:152). The bacillus is capable of surviving in the air for a period of about thirty minutes, especially in areas that are poorly ventilated and lack negative air pressure system. The influenza virus, on the other hand, falls within the *Orthomyxoviridae* family of viruses as an RNA virus, which can be acquired in the air as large droplet particles or through physical contact, and the virus is known to remain on the skin of the affected for about five minutes (Sydnor & Perl 2011:154).

2.4.1.3.2 Transmission of blood-borne HBA in health care workplaces

(i) Transmission through needle stick and sharp injuries: Statistical overview

Studies show that punctures account for the highest exposure to infected blood and body fluid (Deuffic-Burban et al 2011 5). Of a total of 564 exposed HCWs in a study by Treakle, Schultz, Giannakos, Joyce and Gordin (2011:905), punctures took the lead as they accounted for 86% of the transmission of HBA. Laramie, Pun, Fang, Kriebel and Davis (2011:541) rank ordered the types of needles and sharps responsible for percutaneous injuries as hypodermic needles; suture needles; winged steel needles; scalpel blades; intravenous stylets; vacuum tube collection holder and needle; and other sharp devices. In addition, Tosini, Ciotti, Goyer, Lolom, L'Hériteau, Abiteboul, Pellissier and Bouvet (2010:402) rank the winged steel needles as the highest source of HBA followed by intravenous catheters, prefilled syringes and vacuum tube blood collection devices, with the others having very low incidences of NSI. Needle stick injury (NSI) had a stake of 66% as compared to 20% of sharps injuries (Tosini et al 2010:402). McDiarmid (2014:317) reiterates that about 40%-60% of both hepatitis B and C infections are attributable to percutaneous exposure, whilst Cho, Lee, Choi, Park, Yoo and Aiken (2012:1026) state that 2.5% of HIV infection in developing countries is attributable to percutaneous exposure among health care workers (HCWs). Developed countries have a low reported infection rate comparatively due to percutaneous exposure, i.e. have an 8%-27% for the same infections. A type of unit based analysis shows that most needle stick injuries (NSI) occurred in acute care areas such as intensive care units as compared

to the wards (Cho et al 2012:1030), which is contrary to the findings by Kruger, Jimoh and Joubert (2012:7), which indicated that most NSI occurred in the wards than in any other type of unit in a South African study of a Regional health care hospital. Poor needle disposal and needle recapping (Lipscomb, Sokas, McPhaul, Scharf, Barker, Trinkoff & Storr 2009:564) were said to exacerbate the situation. The likelihood of transmission of an HBA through a needle stick or sharps injury is said to be at 30% (Deuffic-Burban et al (2011:5). Nonetheless, Kruger et al (2012:4) point out that among HCWs, nurses present the highest rates of seroconversion post NSI. The sources of infection for HCV and HBV for HCWs were said to be in and outside of their workplace, and according to Kateera, Walker, Mutesa, Mutabazi, Musabeyesu, Mukabatsinda, Bihizimana, Kyamanywa, Karenzi and Orikiiriza (2015:205), haircuts, body piercings and nail cuts are examples of situation from which one can get exposure to the viruses outside of a workplace.

(ii) Transmission through spills and splashes of infected blood and body fluids

Spills and splashes in health care occur from different types of liquid waste, such as blood and body fluids, chemicals like formaldehyde, mercury from thermometers, cytotoxic drugs, radioactive material and laboratory wastes (Biswal 2013:100). Contamination from such items poses a health risk among health care workers. Mercury, for example, is neurotoxic and can affect the immune and digestive systems as well as the skin, eyes, lungs and kidneys (Biswal 2013:100). A study by Engelbrecht et al (2015:23) in three South African hospitals in the Free State Province, highlights the risks arising from splashes from bedpan contents among HCWs working in casualty, medical wards, intensive care unit and the paediatric gastroenteritis unit. Accidental contact with biological fluids, as Rim and Lim (2014:44) state, is high in health care, especially among the nurses, as a result of the direct care provided to patients. Care-related activities associated with accidental exposure include care of wounds, medicine administration, invasive and non-invasive procedures that nurses are engaged with (Rim and Lim 2014:44). Spills and splashes in operating room theatres have been reported in Chernovsky, Sipe & Ogle (2010:11) to occur during surgery, with the highest incidences being during bone cutting surgery, which has a 100% frequency in the UK, followed by orthopaedic surgery at 76% average for USA and UK, while splashes during a caesarian section were at 56% and 32% for vaginal births.



(iii) Transmission through contact with other infected sources

An HCW's contact with a contaminated intermediate source, such as hands, instruments or devices, may result in transmission of HBA (Siegel, Rhinehart, Jackson & Chiarello 2007:16). In addition, Kolmos (2012:32) includes contact surfaces such as toilet seats, chairs and door handles as sources of pathogens that health care workers (HCWs) come into contact with. Bearman, Bryant, Leekha, Mayer, Munoz-Price, Murthy, Palmore, Rupp and White (2014:114) on the role played by hospital attire in cross-transmission, found out that nurses' uniform and doctors' white coats come into close contact with patients and harbour about 5%-29% of the *Staphylococcus Aureus* pathogen, especially around the sleeves and moreover if there is less frequent laundering of the hospital attire, becoming a source of transmission of HBA. Exposure to dermatological conditions, such as contact dermatitis through contact with an infected patient, is another example of transmission through contact, which results in the diagnosis of occupational contact dermatitis (OCD) among South African (SA) HCWs (Rose & Rees 2014:11).

The most common acquired blood-borne diseases, arising from occupational transmission, are hepatitis C, hepatitis B and the human immunodeficiency virus (HIV) disease (Mathewos, Birhan, Kinfu, Boru, Tiruneh, Addis & Alemu 2013:508). In addition, the most common acquired air-borne diseases are Tuberculosis (Health Systems Trust 2013:69) and Influenza diseases (Nukui, Hatakeyama, Kitazawa, Mahira, Shintani & Moriya 2012:60).

2.4.1.4 The challenges of biological hazards among HCWs within the global and South African contexts

2.4.1.4.1 Challenges of exposure to *Mycobacterium Tuberculosis* among HCWs

(i) The global context

Statistics indicate that about 60% of HCWs provide patient care which exposes them being in direct contact with hazardous biological agents (HBAs) and other occupational risks associated with the provision of such care (Lee, Han, Choi, Choi, Oh, Lee, Kim, Kim, Woo & Shim 2009:1218). Globally, the dual epidemic of TB and the human immunodeficiency virus (HIV) infections are a burden and a challenge (Health Systems

Trust 2013:69) that HCWs have to face and endure for the rest of their working lives. The burden of infectious agents poses a challenge to health care workers (HCWs) who are considered to be the highest occupational group at risk of contracting occupational Tuberculosis (TB) (Health Systems Trust 2013:69). Occupational exposure to Mycobacterium Tuberculosis among health care workers has, over the years, continued to be an occupational health challenge (Khawcharoenporn, Apisarnthanarak, Sungkanuparph, Woeltjie & Fraser 2011:14) and continues to grow.

(ii) *Challenges of exposure to Mycobacterium Tuberculosis among HCWs: The South African context*

The 2014 WHO Global TB Report estimates reveal South Africa (SA) among the top 30 TB high-burden countries (HBCs) (WHO 2015:19). The country with the highest TB incidence based on the total global estimates in 2014 was India at 22.7%, and SA ranked 6th at 4.6% (WHO 2015:19). The highest global population estimation of the TB-HIV co-infection were found to be in SA at 22.5% (WHO 2015:19). A descriptive TB infection control study by Naidoo, Seevnrain and Nordstrom (2012:1600), conducted at primary health clinics in Durban, South Africa shows the prevalence of morbidity and mortality related to TB infection among SA HCWs. The study points out poor TB infection control practices and a notable morbidity and mortality among HCWs as linked to TB infection (Naidoo et al 2012:1600). Tuberculosis contagion is shown related to poor infection control practices considering the high influx of patients suffering from tuberculosis, streamlined to decentralised primary health care facilities, which are geared towards handling human immunodeficiency virus (HIV), sexually transmitted infections (STIs), and TB (Naidoo et al 2012:1600). In addition, the findings of Claassens' (2006) retrospective analytic study shows that the 2006 outbreak of extreme drug-resistant tuberculosis (XDR-TB) in KwaZulu-Natal resulted in the loss of lives of some HCWs, as documented in Claassens et al (2010:1578). The study, conducted on community-based health care researchers who had contact with TB patients from day-to-day, supports other research findings, as it yielded the same results that the community health care workers experienced a higher incidence of TB as compared to the general community in which they live and work in. An interesting finding in Claassens et al (2010:1578) is that only female participants developed TB, with the explanation for the probability being that they were the majority participants (68%), and in the high-risk age group (21-30 years). Furthermore, the Health Systems Trust (2013:70) reported a high prevalence rate of

MDR-TB and XDR-TB among HCWs than among the community, with the MDR-TB incidence ratio of 5.46 and XDR-TB incidence ratio of 6.69 when compared with non-HCWs.

Casas, Decroo, Mahoudo, Baltazar, Dores, Cumba, De Weggheleire, Huyst and Bottieau (2011:1450) explain that the challenge of HCWs over-burden with infectious diseases and the high risk of exposure, is experienced most in those countries and areas with high epidemic prevalence. The situation may also be exacerbated by the fact that HCWs would be staying in the communities where there is a high prevalence of these diseases.

2.4.1.4.2 The prevalence of Influenza infections among HCWs

Influenza outbreaks, such as the A/H1N1, are common in health care settings and place doctors and nurses at increased risk of contracting the disease (Nukui et al 2012:60). The WHO's global estimates of the influenza virus epidemics are at 5%-10% within the general population with the results of annual mortality ranging from 250 000-500 000. Further estimates provided in Coulliette, Perry, Edwards and Noble-Wang (2013:2148) show that the 2009 A (H1N1) caused 12 469 deaths out of 60, 8 million people who were hospitalised. However, the study did not reflect a total number of HCWs deaths, but suffice to say that it is the HCWs who are always at risk of contracting any new or existing forms of infectious diseases. Furthermore, the infected HCWs become carriers and spread the disease among themselves, patients and the families/community in which they live in (Vanhems, Voirin, Roche, Escuret, Regis, Gorain, Pires-Cronenberger, Giard, Lina, Najjioullah, Barret, Pollissard, David, Crozet, Comte, Hirschel & Ecohard 2011:151).

It should also be noted that complications from influenza are estimated as having about 10% fatal results. The 2009 A (H1N1) is said to have caused 12 469 deaths out of 60, 8 million people who were hospitalised (Coulliette et al 2013:2148). The study, however, does not reflect the total number of HCWs deaths, but reflects that the HCWs are always at risk of contracting any new or existing forms of infectious diseases.

2.4.1.4.3 *The prevalence of exposure to the human immunodeficiency virus (HIV) among HCWs*

(i) *The global context*

Though it carries a life scare, HIV is said to be less transmitted nosocomially when compared with HBV and HCV (Syndor & Perl 2011:157). HIV carries less chances of transmission on mucosal contact and non-intact skin contact with blood, as noted by Syndor and Perl (2011:157), whose study show that out of 559 HCWs who experienced contact with infected body fluids from HIV-infected patients, none of the HCWs tested positive for HIV from the experience. Nevertheless, occupationally acquired HIV has been reported among 57 HCWs in the US, whilst 138 was reported for possible infection with occupational HIV from 2001 (Syndor & Perl 2011:157).

(ii) *The South African context*

South Africa is one of the leading countries with HIV infection (Department of Health 2012a:9), and the risk of exposure to HCWs is imperatively high. About 6, 1 million South Africans were reported in 2014 to be living with the virus, and 2, 4 million were initiated on anti-retroviral therapy (ART) (Department of Health 2014a:9).

(iii) *Effects of HIV and AIDS on the health of HCWs*

The prevalence of HIV and AIDS in the workplace makes HCWs prone to contracting the virus, due to the increased exposure time and increased number of infected patients (Department of Health 2014:9). A study conducted among student nurses caring for HIV infected and AIDS patients at six hospitals in a district of Mpumalanga Province in South Africa identified that the participants had anxiety and concerns regarding the possibility of contracting HIV whilst caring for HIV infected patients (Sehume, Zungu & Hogue 2012:18).

2.4.1.4.4 *The challenge of exposure to hepatitis B (HBV) among HCWs*

(i) Global estimates

Health care workers (HCWs) have a ten-fold risk of HBV acquisition from contact with infected patients or material when compared with the general population. HBV transmission to HCWs is more likely when compared with HIV transmission. HBV risk of transmission stands at 6%-30% compared to the 0.3% in the case of HIV (Syndor and Perl 2011:157).

The reviewed literature provides global estimates of HBV infection standing at between 200 and 370 million people (Michel & Tiollais 2010:288; Dény & Zoulim 2010:245). The majority of people (60%-80%) who are acutely infected with the virus do not show symptoms according to Dény and Zoulim (2010:246).

(ii) South African estimations

The estimates of HBV in South Africa have been cited as 10% and 1% in rural and urban populations, respectively (Firnhaber Reyneke, Schulze, Malope, Maskew, MacPhail, Sanne & Di Bisceglie 2010:[2]), as corroborated in Patel, Davis, Tolle, Mabikwa and Anabwani (2011:390) who estimated HBV at 7.4% in rural and 1.3% in urban populations. However, the prevalence of HIV-HBV co-infection means that the actual estimations of HBV among people infected with HIV is still to be investigated (Firnhaber et al 2010:[2]).

(iii) Effects of HBV on the general and reproductive health of HCWs

The hepatitis B virus (HBV) infection leads to debilitating pathological changes of the liver which are said to have disastrous outcomes (Aspinall, Hawkins, Fraser, Hutchinson & Goldberg 2011:531) such as the inflammatory liver disease (Michel & Tiollais 2010:288). A wide range of diseases is associated with HBV infection and these include acute hepatitis, hepatic failure, progressive chronic hepatitis, liver cirrhosis and hepatocellular carcinoma (Dény & Zoulim 2010:246). Finally, an epidemiologic study of HBV protective efficiency and therapeutic potential of HBV vaccines shows that the transmission of HBV from an infected mother to a child has is high during birth, thus putting the lives of unborn children at risk (Michel & Tiollais 2010:288).

2.4.1.4.5 *The magnitude of exposure to hepatitis C (HCV) among HCWs*

(i) Global estimates

Karani et al (2011:462) cite global estimates of the HCV exposure rate to HCWs at 2.6%, which equates to about 16 000 infections, whereas Treacle et al (2011:904) estimate the occupational HCV infection at 390 cases in the USA. Developed countries experience HCV infections due to intravenous drug use whereas in developing countries infected blood and body fluids in health care are the main drivers of HCV (Averhoff, Glass & Holtzman 2012:11). The highest prevalence of HCV is said to be in Egypt at 20%.

(ii) South African estimates

The South African estimates of HCV are around 0.1-1.7% (Abuelhassan 2012:93). The HCV genotype 5 is predominant in South Africa and is responsible for 40% of chronic infections (Abuelhassan 2012:93).

(iii) Effects of HCV on the general and reproductive health of HCWs

The risk of exposure to HCV is that 27% of liver cirrhosis and 25% of hepatocellular carcinoma are attributed to HCV (Okosun 2014:80; Abuelhassan 2012:93), and treatment options at the moment are said to be poor, with no vaccination available. A further challenge is that HCV is asymptomatic among those infected, and may be unknowingly transmitted to HCWs through unsafe medical practices (Abuelhassan 2012:94).

A study by Abuelhassan (2012:94) on the epidemiology of HCV revealed that mothers (including pregnant HCWs) infected with HCV have a 10% chance of transmitting the virus to their babies during birth, and the risk of transmission is not reduced through performance of a caesarean section either (Abuelhassan 2012:94). However, there is no evidence of increased risk to the baby during breast feeding (Abuelhassan 2012:94).

.4.2 Chemical hazards in health care workplaces

2.4.2.1 Sources of chemical hazards in health care workplaces

Chemical hazards consist of the commonly used detergents, disinfectants, antiseptics and other cleaning material, latex rubber gloves and toxic drugs in health care workplaces that may be potentially dangerous to those who come into contact with them (Nagendran et al 2009:270; Pretty et al 2010:24). Chlorhexidine, a commonly used antiseptic among HCWs, is an example of a possible chemical hazard to HCWs, as it can cause reactions (Nagendran et al 2009:271, 272).

2.4.2.2 Mode of exposures to chemical agents among HCWs

Exposure to chemical hazards can arise from surfaces that are contaminated with chemicals, such as cytotoxic drugs which are also known as antineoplastic drugs (ADs) and used for cancer treatment (Pretty et al 2010:24). Contamination by ADs in workplaces occurs in different ways and these include surface, airborne, and contact with the urine of patients and even HCWs noted to have huge quantities of ADs in their urine (Pretty et al 2010:24). Furthermore, HCWs' use of latex rubber gloves results in contamination with latex powder (Cao, Taylor, Sood, Murray & Siegel 2010:1001) and ultimately allergic contact dermatitis.

2.4.2.3 The effects of chemical hazard exposures on general and reproductive health among HCWs

2.4.2.3.1 The effects of chemical hazards on the general health of HCWs

The findings from a hospital-based study on chlorhexidine usage by HCWs in the United Kingdom, as cited in Nagendran et al (2009:271, 272), indicate that exposure to chlorhexidine as a potential allergen has a likelihood of producing IgE-mediated hypersensitivity reactions such as urticaria, angioedema, itching, and in the worst case scenario, anaphylactic reactions.

An Indian review study on concerns regarding liquid biomedical waste among medical doctors, indicates mercury as one such waste material (Biswal 2013:100). Contamination

with mercury among HCWs has neurotoxic effects that can affect the immune and digestive systems as well as the skin, eyes, lungs and kidneys (Biswal 2013:100).

A number of allergies are also triggered by the use of latex gloves. Latex allergy and latex sensitisation arise from the hazardous effects of the latex powder found in the latex gloves used by HCWs (Phaswana & Naidoo 2013:4). A South African study on latex allergy and latex sensitisation was conducted at a tertiary hospital in KwaZulu-Natal among HCWs, and the findings indicated 5.9% of the HCWs had latex sensitization, while 4.6% had latex allergy (Phaswana & Naidoo 2013:4). There were significant associations between latex sensitisation and a runny nose, itchy skin, skin rash and itchy eyes (Phaswana & Naidoo 2013:4). A similar study on the use latex gloves was conducted among 23 patients, of which 70% of the patients were HCWs, at a dermatology clinic in Cleveland, America, who were presenting allergic contact dermatitis (Cao et al 2010:1001). The study findings reveal that glove chemicals had autoeczematization of dermatitis on 30% of participants, 13% hand/wrist dermatitis spread the arms, and 9% spread to the face and neck (Cao et al 2010:1006). The study findings noted further effects of glove chemicals, which included contact urticaria, irritant contact dermatitis, atopic dermatitis, eczema and asteatotic eczema, psoriasis and lichenoid eruptions.

2.4.2.3.2 The effects of chemical hazards on the reproductive health of HCWs

The handling and administration of antineoplastic drugs (ADs) for the treatment of cancer is done by HCWs (Bussi eres, Tanguay, Touzin, Langlois & Lefebvre 2012:429), and this has been shown to have adverse effects on those handling them since these drugs have carcinogenic, teratogenic and mutagenic properties (Kopp et al 2013:47; Pretty et al 2010:24). ADs are known to cause reproductive complications such as infertility, miscarriages, congenital abnormalities and stillborn babies among the HCWs (Pretty et al 2010:24).

A study by Avil es-Palacios, L opez-Quero and Garc ia-L opez (2013:27) reveals that 31% of OHS professionals in various companies believed that there is risk of endangerment for pregnant workers from chemical exposure, while 42% saw no specific risks for women other than those who were pregnant. In addition, Salihu, Myers and August (2012:93) affirm that chemical exposure is associated with a number of foetal outcomes such as low birth weight (LBW), small for gestational age (SGA), and preterm birth in various

industries. Finally, exposure to radiation in health care has also been associated with spontaneous abortion, foetal mental retardation and restricted growth, and cancer.

2.4.3 Ergonomic hazards in health care workplaces

2.4.3.1 Describing ergonomic hazards in health care workplaces

Work-related MSDs are defined by the WHO as problems of the muscles and bones arising from factors within the work environment and circumstances under which work is performed (Magnavita, Elovainio, De Nardis, Heponiemi & Bergamaschi 2011:196). Ergonomic hazards refer to factors as such load carrying, excessive force, awkward posture, heavy lifting (Burton 2010:84), and authors such as D'Arcy, Sasai and Stearns (2011:837) and Schoenfisch and Lipscomb (2009:117) add posture and lifting with equipment design and job design to explain as other examples of ergonomic hazards.

Nonetheless, ergonomic hazards in the health care workplace are commonly found in cases whereby HCWs are involved in the manual handling of very sick, obese, and or immobile patients who need regular lifting, turning and transferring, such that HCWs adopt awkward positions to carry out the actions, which are standardised health care procedures (D'Arcy et al 2011:837; Schoenfisch & Lipscomb 2009:117). The use of incorrect or awkward postures by HCWs may occur during activities such as patient lifting and turning and may result in injuries to the back as argued by Lim, Black, Shah, Sarker, Metcalfe (2011:185) who draw on a quasi-experimental study on patient handling interventions conducted at six Canadian hospital residents.

2.4.3.2 Types of ergonomic hazards and their impact among HCWs

2.4.3.2.1 The impact of awkward body posture and lifting on the general health of HCWs

A review study conducted on 16 OHS interventions studies from Sweden, U.S., Norway, Finland, U.K., France, Canada, Israel and Australia found out that HCWs become prone to sprains and strains when engaging in frequent lifting of patients without lifting equipment and sufficient training on the lifting of patients (Tullar, Brewer, Amick III, Irvin, Mahood, Pompeii, Wang, Van Eerd, Gimeno & Evanoff 2010:200). The assumption of awkward positioning or body posture during lifting contributes further to the straining of

back muscles (Lim et al 2011:185) and results in injuries to respective bones and muscles are as a result of repetitive movements (Schoenfisch & Lipscomb 2009:117).

(i) *Lower back pain (LBP) among HCWs*

Study findings from an assessment of musculoskeletal pain on different anatomical sites of four occupational groups in Sri Lanka, depicted that nurses were the highest occupational group that experienced low back pain (LBP), when compared with computer operators, sewing mechanists and postal workers (Warnakulasuriya, Peiris-John, Coggon, Ntani, Sathiakumar & Wickremasinghe 2012:271). LBP is associated with factors such as a high rate of occupational lifting (Warnakulasuriya et al 2012:271). The study on occupational health hazards at Uganda's eight major hospitals, carried out by Ndejjo, Musinguzi, Yu, Buregyeya, Musoke, Wang, Halage, Whalen, Bazeyo, Williams and Ssempebwa (2015:[1]), concurs with the previous authors as noted in their highlighting that 77% of back pain is prevalent among HCWs than among other occupational groups. In addition, the Tullar et al (2010:200) study on nursing assistants, in Sweden, U.S., Norway, Finland, U.K., France, Canada, Israel and Australia, noted the prevalence of lower back pain, which was attributed to the transferring of patients, bearing in mind the patient's weight and the method of transfer used. Another effect of low back pain (LBP) is that it is a high economic health-related burden to companies due to prolonged absenteeism by workers (Buijs, Lambeek, Koppenrade, Hooftman & Anema 2009:65).

(ii) *Musculoskeletal disorders (MSDs) among HCWs*

The highest rates of musculoskeletal disorders (MSDs) have been noted in literature as existing among all categories of nurses, and higher than in other occupations (Rodriguez-Acosta et al 2009:953; Schoenfisch & Lipscomb 2009:117).

Musculoskeletal disorders are said to impede physical health and functionality as indicated in a Netherlands cross-sectional study based in a health care setting, on employees who were booked off sick for longer than six weeks, but less than two years (Vroege, Hoedeman, Nuyen, Sijsima & Van der Feltz-Cornelius 2012:52, 56).



2.4.3.2.2 The impact of nursing workload on the general health of HCWs

Nursing workload is defined in Neill (2011:137) as activities that require a certain amount of performance to be achieved in a specific period of time. Nurses therefore, encounter challenges associated with both the physical and mental workload, with the mental workload defined as the thought processes that are invested by a worker in achieving the physical and environmental demands of their work (Neill 2011:133).

Hazards associated with the organisation of work patterns are responsible for a number of musculoskeletal injuries (Schoenfisch & Lipscomb 2009:124). These hazards are related to workplace issues such as workload demands and the pace of work (Schoenfisch & Lipscomb 2009:117).

The challenge for nurses with increased workloads is that high workloads have the potential of putting a strain on the psychological health of the HCW (Lenthal, Wakerman, Opie, Dollard, Dunn, Knight, MacLeod & Watson 2009:210), and this is said to be exacerbated by the shortage of staff. As a result, burnout or stress may surface as signs of the mental strain taken by HCWs (Lenthal et al 2009:210).

The findings of an American study on nurses (Neill 2011:133), reveal that increased nursing workload poses a challenge for nurses as they experienced stress related to a heavy workload, due to the fact that the provision of patient care was not of their envisaged standards. Heavy workloads adversely affect patient satisfaction and working relations among health care personnel (Neill 2011:137). An excessive nursing workload is linked further to the risk for nurses, of exposure to hospital acquired infections (HAI), due to lack of adherence to sterile techniques (Daud-Gallotti, Costa, Guimaraes, Padilha, Inoue, Vasconcelos, Rodrigues, Barbosa, Figueiredo & Levin 2012:[3]).

2.4.3.2.3 The effects of ergonomic hazards on the reproductive health of HCWs

A literature review study conducted in Salihu et al (2012:91) shows inconsistencies with regard to the effects of normal work activities, such as standing, bending, lifting, and long hours of work, on foetal outcomes. Whilst other results reported no negative effects on the foetus, others reported that the extent of manual labour and physical demands or the

nature of work, may affect a pregnant worker (Salihu et al 2012:91). The effects of various hazards on pregnancy among HCWs are thus highlighted in this section.

(i) Long periods of standing and pregnancy among HCWs

Periods of standing that go beyond eight hours increase the chances of spontaneous abortion, as noted in a literature review study by Salihu et al (2012:91). Though no association was found to exist between standing and preterm birth, pregnant women who experience standing at their workplace have high chances of preterm than those who do not stand at work. Thus, preterm birth and spontaneous abortion have a link with standing under specific conditions Salihu et al (2012:91).

(ii) Awkward body posture and lifting

Preterm birth according to Salihu et al (2012:92), is associated with bending and lifting that lasts more than an hour in one day, whilst normal manual labour has conflicting results in as far as preterm birth was concerned. (Salihu et al 2012:92) found out that increased manual labour was associated with pre-eclampsia.

2.4.4 Physical hazards in health care workplaces and their impact on HCWs

Physical hazards are presented in this section under definition, sources and the impact they have on the health of HCWs. The discussion focuses on slips, trips and falls (STF) as a common occurring physical hazard among HCWs.

2.4.4.1 Defining physical hazards

Physical hazards are defined as non-biological hazards presenting themselves in health care workplaces and exposing workers to environmental conditions which may result in injuries and illnesses, with examples including slips, trips, falls (STF) and electrical hazards (Ndejjo et al 2015:[3]).

2.4.4.2 Sources of physical hazards in health care workplaces

Faulty equipment and inappropriately placed equipment constitute some of the sources of physical hazards that may cause injuries among HCWs (McDiarmid 2014:316). Boxes and stock piles, liquid spills, electric cords and stairs are some of the obstacles and contributors to a hazardous health care work environment (Chernovsky, Sipe & Ogle 2010:[5]; Drebit et al 2010:526). A study on occupational falls conducted among workers in health care in 145 health facilities in Canada, identifies falls caused by obstacles, liquids, slopes, steps, cords and uneven flooring as one of the leading disabling occupational injuries (Drebit et al 2010:526).

2.4.4.3 Slips, trips and falls among HCWs

A significant difference between a higher incidence of falls in females (92%) compared to males (8%) was revealed in a study on falls among HCWs in 145 health facilities in British Columbia (Drebit et al 2010:526). In addition, Mogale, Malangu and Huma's (2014:75) study findings demonstrate that more than 73% of female South African health workers experienced falls than their male co-workers with 26%. Gender was highlighted, among individual factors leading to falls, as a risk factor associated with falls as noted by Kemmlert & Lunholm (2001) and Verma et al. (2008), as cited in (Drebit et al 2010:526).

2.4.4.4 The impact of slips, trips and falls (STF) on health care workers

2.4.4.4.1 The impact of falls on the general health of HCWs

Tripping and falling among HCWs are said to be common in the health care workplace, results of which could be illnesses, injuries and even fatalities (McDiarmid 2014:316). The falls, which are grouped together as "slip, trip and fall (STF)", contribute greatly to sick days taken off work by workers (Drebit et al 2010:525). STF impact on the health of HCWs by causing physical pain which may require a worker to be off work which results in the consequent loss of work days and non-productivity (Mogale et al 2014:73).

2.4.4.4.2 *The impact of falls on the reproductive health of HCWs*

Findings from a literature review study conducted by Salihu et al (2012:91) indicate falling as a cause for concern, for 1:4 women reported falls during pregnancy which happened mostly at the 5th-7th month of pregnancy and 23% of these were encountered at work. The findings also show that the falling seemed to be work-related than pregnancy-related (Salihu et al (2012:91)).

2.4.5 Psychosocial hazards in health care workplaces

2.4.5.1 *Defining psychosocial hazards*

Psychosocial hazards, also referred to as workplace stressors, are described as non-physical hazards that are located within the workplace, and affect the workers psychologically, socially as well as physically, and may result in mental strain and emotional stress to workers (Burton 2010:85).

2.4.5.2 *Types of psychosocial hazards and their impact on HCWs*

Examples of psychosocial hazards include shift work issues; long working hours; poor working relationships; poor management practices; inadequate resources (human and material); unsafe workplaces; workplace violence; and home-work imbalances (Burton 2010:85). Similar psychosocial hazards are highlighted in Lenthal et al (2009:210), as responsible for psychological health problems among HCWs in a study conducted on rural nurses (Lenthal et al 2009:210).

2.4.5.2.1 *The impact of shift work on HCWs*

Shift work is considered as a potential psychological hazard (Takahashi, Iwakiri, Sotoyama, Hirata & Hisanaga 2009:197). It is known to cause stress and other untoward consequences among HCWs. In a US study on shift work among registered nurses, McClelland, Switzer and Pilcher (2013:64) found out that a 12-hour shift impacted significantly on the nurses' work decisions regarding patient care. Patient care decision-making was found to be compromised during a 12-hour day shift. McClelland et al's (2013:60) study's findings on the psychological impact of shift work on nurses shift

report that working a 12-hour shift leads to poor judgement and poor decision making. Some of the HCWs' shift work-related problems are fatigue, sleepiness and poor performance (McClelland et al 2013:60). Takahashi et al (2009:197) reiterate that shift work-related problems could spill over to family life, especially in cases where HCWs are unable to attend family gatherings and other family matters, and that shift work may be viewed as a hindrance to HCWs quality time with their families.

Burnout was reported is also considered as one of the results of the psychosocial effects of shift work (Wisetborisut, Angkurawaranon, Jiraporncharoen, Uaphanthasath & Wiwatanadate 2014:285). Night shift, according to Wong, McLeod and Demers (2011:59), creates a non-enabling situation for regular child rearing duties, particularly in female workers. Another significant finding is the burden of injury during night shift work, which is reported to be high among females than among males. Hence, although shift work remains a challenge in the health care industry, it cannot be avoided as noted by McClelland et al (2013:60).

Finally, a study on the effects of shift work among general Canadian citizens in Wong et al (2011:59), though not inclusive of HCWs, yielded a significant result which highlights the challenges faced by women when compared with men, regarding the balance of work and home demands. There was a shift towards working flexi hours especially among females than working regular hours which were not accommodative of home demands.

2.4.5.2.2 The impact of long hours of work on the health of HCWs

Long hours of work affect the physical and psychosocial well-being of workers, and hence the health of female workers (Kleiner & Pavalko 2010:1467). Some of the physical health problems are related to cardiovascular, reproductive, sleep-related, and gastrointestinal (Knutsson & Bøggild 2010:87; Wong et al 2011:54). Stimpfel, Sloane and Aiken (2012:2501) indicate that long work hours pose challenges to nurses and lead to fatigue and later burnout.

2.4.5.2.3 The impact of poor working relationships on HCWs

A study conducted in eighteen American Midwestern nursing faculties, reveals that poor interpersonal relationships among faculty nurses are one of the stressors leading to psychological strain (Kuehn 2010:195; Milton 2010:288). Further studies on interventions seeking to reduce psychosocial work factors and mental health problems among health care professionals in hospital settings, identified lack of team work and team spirit; incivility like rudeness and lack of respect for colleagues; and lack of autonomy; as attributing to psychosocial stress among HCWs (Bourbonnais, Brisson & Vézina 2011:482; Spence-Laschinger, Leiter, Day & Gilin 2009:304; McHugh, Kutney-Lee, Cimiotti, Sloane & Aiken 2011:205). Nurses reported a lack of mutual assistance, respect and recognition from senior colleagues and doctors. In particular doctors demonstrated negative attitudes towards nurses, undermined their competence and took them for granted (Bourbonnais et al 2011:482).

2.4.5.2.4 The impact of poor management practices on HCWs

Poor management practices here include lack of support from managers and their failure to promote a work environment that is supportive of progress, growth and the advancement of workers, in this case that of HCWs (Lautizi, Laschinger & Ravazzolo 2009:450). Poor management practices pose a challenge and may be a push factor for nurses to leave their current employment for greener pastures, as managers are perceived as having a leading role in the creation of supportive environments that foster growth and advancement (Lautizi et al 2009:450). Managers need to collaborate with worker representatives regarding health promotion within the workplace (Burton 2010:5). A South African study by Kruger (2012:23) which examined the perceptions and experiences of safety representatives in a hospital setting shows that some managers were not being supportive of safety representatives and demonstrated lack of insight in some of the issues pertaining to OHS. Of concern was the fact that some aspects of OHS legislation were flouted by managers (Kruger 2012:23). For example, proper election procedures for the appointment of worker representatives was not followed, instead managers hand-picked individuals to represent the workers rather than following the Amended OSH Act, No. 85 of 1993 (OHS Act No. 85 of 1993:11) stipulation that workers should elect representatives themselves from among their pool who will be able to represent them in the OHS committee. In their study on issues of trust towards managers

by allied health professionals, Engelbrecht et al (2015:26) show that professionals felt that managers could not be trusted to keep the workplace healthy and safe for their well-being.

2.4.5.2.5 The impact of a shortage of human and material resources on HCWs

There is a serious shortfall of HCWs, especially in poor countries, with Sub-Saharan Africa countries listed among those relatively resourced (Ndejjo et al 2015:[1]). The South African public health sector is experiencing its share of nurse shortages, as noted in the report of the Strategy for the Health Sector 2012/13 – 2016/17: Human Resources for Health South Africa, 2011 (Department of Health 2011:21).

The stagnation is corroborated by George, Gow and Bachoo (2013:[1]) who highlight the public-private disparity as attributing to the shortage. Some push factors attributing to this serious challenge of nurse shortage in public hospitals include 'poor working conditions', the burden of diseases, increased workloads, unsafe working environment with little or no security, and lack of material resources (Department of Health 2011:32). Casas et al (2011:1450) further attribute the shortage of HCWs to ill-health and mortality of HIV-infected HCWs which depletes the already inadequate numbers of HCWs, for about 15-20% of young South African HCWs are projected as infected with HIV, while in Malawi the estimation, based on numbers of HCWs visiting a particular health care facility, was 63% (Casas, et al 2011:1450). Finally, a high influx of patients against a low supply of HCWs puts a strain on the physical, psychological, social and emotional well-being of the HCWs (Casas et al 2011:1450).

2.4.5.2.6 The impact of an unsafe workplace on HCWs

South African public hospitals are considered, by the HR Strategy for the Health Sector, 2012/13, as unsafe and unhealthy work environments (Department of Health 2011:31). As a result, both physical and psychological factors may be responsible for rendering a workplace unsafe and unhealthy. Nurses concerns regarding personal safety and workplace violence are cited as contributing to the making of the public hospitals as unsafe and unbearable for HCWs (Department of Health 2011:31). The impact of unsafe workplaces on nursing staff is an attrition in public hospitals, with the attrition rate estimated at 25%. An unhealthy working environment in public hospitals pushes staff to

leave the service and creates more personnel shortages (Department of Health 2011:31). Workplace violence is another area of challenge in the work environment. According to Eidhammer, Flutttert and Bjørkly (2014:2719), violence against HCWs in forensic mental health facilities is rife owing to the problem of anger from mental health care users.

2.4.5.2.7 The impact of workplace violence on HCWs

(i) Defining workplace violence

The National Institute for Occupational Safety and Health (NIOSH) defines workplace violence as acts of violence in a work environment, aimed at an individual(s), and taking the form of a threat or physical assault, according to Esmailpour, Salsali and Ahmadi (2011:130).

(ii) Forms of workplace violence

- *Physical violence/aggression*

Physical aggression or violence is defined by Magnavita and Heponiemi (2012:[1]) as vigorous, unwanted and unfriendly behaviour towards another person or between persons resulting in no harm or some form of harm. The physical form of violence has been described, in the findings of an American study reported in the 4th International Conference on Violence in the Health Sector, as a push, a kick, a slap or severe assault and murder (Needham, Kingma, McKenna, Frank, Tuttas, Kingma & Oud 2014:40). In health care workplaces physical violence takes place in the form of physical abuse from colleagues, patients and sometimes family members (Magnavita & Heponiemi 2012:[1]). An Italian study conducted among all workers undergoing periodic workplace medical examination at a District hospital and some local health services, discovered that nurses and doctors experience more physical aggression than other workers, and the physical aggression is directed more towards males than females (Magnavita & Heponiemi 2012:[3]). On the contrary an Iranian study of young female nurses working in emergency departments found out that most often women were victims of physical violence without a weapon (Esmailpour et al 2011:135).

- *Verbal attacks*

Verbal aggression is defined as actions, words, or a display of attitudes which may be annoying to the person they are intended for (Magnavita 2013:[2]). Verbal abuse among nurses working in emergency departments is reported as the most common form of violence against nurses (Esmaeilpour et al 2011:135). Verbal abuse towards nurses is reported as emanating from patients and their visitors, not excluding colleagues, doctors and nursing managers (Needham et al 2014:59). The findings from an American study on verbal attacks among nurses highlight the fact that an organisations' climate of violence prevention and tolerance to aggression determine the frequency of verbal attacks towards nurses (Needham et al 2014:59). An Italian study among health workers in a specialised hospital indicates that attacks are often linked to the mental state of the workers, such as job strain, lack of support at work and unhappiness, is one of the experiences linked to increased violence from patients towards HCWs (Magnavita 2013:[6]). Magnavita and Heponiemi (2012:[3]) outline that female staff experienced more harassment than physical aggression when compared to males, though a statistical gender difference could not be established.

(iii) The effects of workplace violence on the health of HCWs

Physical and non-physical violence among HCWs tends to affect the workers psychologically, and manifests in the form anger, pain, frustration, misery, and feelings of anxiety (Magnavita & Heponiemi 2012:[5]). Some HCWs consequently leave their employment and move to others (Magnavita & Heponiemi 2012:[5]). Magnavita (2013:[7]), in a study on hospital workers based in a specialised hospital highlights the impact of workplace violence on HCWs as psychological distress, high stress levels because of the aggressive behavior, and poor performance resulting in poor outcomes for patient care.

2.4.5.2.8 The impact of work-home imbalance on HCWs

Role strain, due to improper work-life balance, plays a part in maternal stress, especially in cases where new mothers cannot balance the role of mother and employee (Kuchařová 2009:1286). Julien, Somerville and Culp (2011:167) also point out that the imbalance results in work-life conflicts. Salihu et al (2012:94) indicate that lack of social support from

family, supervisors and colleagues may put psychological strain on pregnant worker and result in preterm birth.

2.4.5.3 Effects of psychosocial hazards on the reproductive health of HCWs

Psychosocial hazards were cited as having an effect on pregnancy as noted from the results of the study conducted by Salihu et al (2012:93) among pregnant women in the workplace. Positions of low power and no decision making lead to workplace stress and the effect on pregnant women in those positions is that they tend to experience gestational hypertension due to stress, whilst other studies such as Niedhammer et al (2009) and Fenster et al (1995) yielded opposing results on workplace stress and pregnancy as reported in Salihu et al (2012:93). Julien et al (2011:171) define job strain as a situation of high job demands and low control, and this situation is identified by Salihu et al (2012:93) as another factor associated with low birth weight (LBW) and small for gestational age (SGA) in some studies, and in others not.

In conclusion, the literature review indicates studies that have been done in the past as evidenced by findings presented in this review, however gaps still exist in literature regarding the types and sources of OHS hazards; and compliance to OHS policy among HCWs in the Tshwane health care district, which are going to be addressed by the findings of the current study.

2.5 OCCUPATIONAL HEALTH AND SAFETY INTERVENTIONS TO PREVENT OCCUPATIONAL HAZARDS

This section is a synthesis of two approaches to prevention and control of occupational hazards and risks. The study draws on the global approach to occupational health and safety, which was initiated at the Global Conference on Connecting Health and Labour: What Role for Occupational Health in Primary Health Care, 2011. It also uses the primary health care (PHC) levels (WHO 2012:6) in line with the generic approach for prevention and control of occupational hazards, which are the hierarchies of control, as mentioned by Burton (2010:84).



2.5.1 Overview of the hierarchy of controls in occupational health

The global approach for prevention and control as suggested by the World Health Organization has adopted elimination or substitution as the first line of control; followed by engineering controls through the design of safe work systems; administrative controls through good housekeeping; and the use of personal protective equipment (PPE) as guidelines (Burton 2010:84).

McDiarmid (2014:318) provides a diagrammatic representation of the hierarchies of control, as shown in figure 2.1. The upside-down pyramid represents an ideal approach where elimination and substitution are the first line of defence in an attempt at effective hazard prevention and control under circumstances where costs are not constrained (McDiarmid 2014:318). Conversely the normal pyramid represents an approach where personal protective equipment (PPE) are used as the first line of defence to prevent and control occupational hazards. This occurs in a situation where cost constraints hamper resource availability (McDiarmid 2014:318).

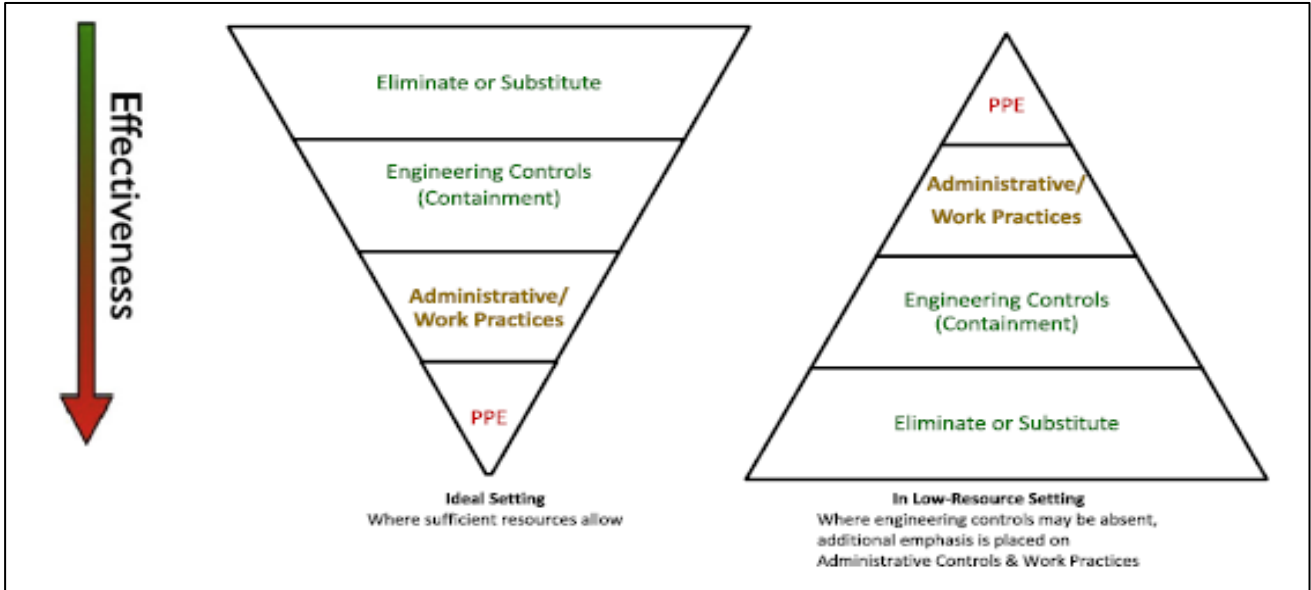


Figure 2.1 Hierarchy of controls
(McDiarmid 2014:318)

2.5.2 Applying the hierarchies of control to prevent occupational hazards and risks

The hierarchies of control measures are presented following the 3 levels of prevention, i.e. primary, secondary and tertiary levels.

2.5.2.1 Primary prevention of occupational hazards in health care workplaces

The primary level of prevention focuses on the improvement of working conditions and interventions to capacitate workers with OHS knowledge and practices geared towards prevention of occurrence of occupational injuries and diseases (GOHNET 2013:6). This section looks into policies, programmes and the culture of an organisation as laying the ground for good occupational health practices. It also considers the importance of worker training, vaccination and surveillance of their health status as contribution towards good occupational health practices.

2.5.2.1.1 Organisational policies

The employers, managers, occupational health and safety personnel, risk personnel, employee representatives and other relevant stakeholders need to come up with decisions that will inform organisational policies that are based on best practices (Tullar et al 2010:200). Policies should be implemented to remove certain behaviours, such as bullying and harassment. Policies on pregnancy, no smoking zones and other issues should be instituted in order to guard against the psychosocial effects on worker well-being (Burton 2010:86). The policies should be geared towards a reduction of occupational injuries through the use of varied prevention strategies and address the reduction of injuries associated with patient-handling.

2.5.2.1.2 Programmes

An exercise training programme, as a prevention strategy for MSD, links well with the enhancement of musculoskeletal health (Tullar et al 2010:200; Speechley 2011:457). Exercise training is beneficial as it increases muscle endurance (Gundewall 1993; Oldervoll 2001); isometric strength, functional coordination (Gundewall 1993); and promotes strength as noted by Oldervoll (2001), cited in Tullar et al (2010:210). However,

evidence found in Tullar et al (2010:216) is not strong enough to suggest that physical exercise interventions would reduce MSD among HCWs.

2.5.2.1.3 Organisational culture

Organisational culture is created by those who work in it. Psychosocial hazards can be minimised by establishing an organisational culture that seeks to foster feelings of trust and togetherness among workers (Spence-Laschinger 2010:875) and between workers and management. This organisational culture should also promote an atmosphere of honesty wherein workers are treated fairly (Burton 2010:85, 88). Therefore, workers need to feel the connectedness with their work environment and enjoy the work they do. In addition, workplace gender-equality policies should be established with the purpose of supporting and protecting women and other vulnerable groups.

2.5.2.1.4 Education and training

HCW education and training could help in lessening injuries, especially the low-back stress and pain among HCWs, and this notion is supported by the findings in a number of studies (D'Arcy et al 2011:837; Grobler 2013:215; Denis, Zelmar, Le Pogam, Chaleat-Valayer, Bergeret & Colin 2012:[4]; Speechley 2011:457). The training programme can only be effective by focusing on the prevention of specific workplace injuries. There are however studies, such as Garg et al (2007) and Hignett et al (2003), cited in D'Arcy et al (2011:838), which dispute the importance of training in curbing the severity and frequency of occupational low-back injuries, unless work modifications are instituted. The majority of studies reviewed in D'Arcy et al (2011), either do not support or have conflicting findings pertaining to the reduction of injuries. D'Arcy et al (2011:838) argue that previous studies are of a poor quality, have limitations in sample sizes and are limited to specific facilities or countries, hence it cannot be conclusively agreed that education and training are not effective in helping to reduce workplace injuries.

Female HCWs should receive training on stressors affecting them in the workplace, such as conflict issues and focus on how to manage them (Burton 2010:85). Situations of harassment and violence against female nurses are common in health care, as a result, measures on how to address them should be incorporated in the education and training to equip workers with skills on how to handle them (Burton 2010:85). Patient education is

cited in Eidhammer et al (2014:2720) as measure of workplace violence control, where patients should be given training on how to cope with psychotic symptoms and their proximity to other people, including HCWs.

2.5.2.1.5 Medical surveillance

The Regulation for Hazardous Biological Agents (R. 7233) in terms of OHSA, 1993 (Act. 85 of 1993) as amended, is prescriptive with regards to the minimisation of exposure to HBAs through medical surveillance and vaccination of workers as a preventative measure against workplace hazards (Regulation R7233, 2001, Paragraph 8(1)(b)). Lee et al (2009:1220) advocate for a 'nosocomial TB exposure surveillance' as one of the preventive strategies for TB infection. Chest X Ray as a screening method are underlined by Claassens et al (2010:1579) and TST as the first-line test to rule out TB infection (Claassens et al 2010:1579; Lee et al 2009:1220). Galgalo, Dalal, Cain, Oeltmann, Tetteh, Kamau, Njenga, MK, Breiman, Chakaya, Irimu, Miller, De Cock, Bock and Ijaz (2008:952) support the notion that HCWs should be encouraged to know their HIV status as the presence of HIV is significantly linked to progression to the TB disease. However, HCWs in a South African public hospitals were found to harbor fears of both knowing their test results and how colleagues might react towards them (Zungu & Sanni 2011:493). Hence, HIV testing should be provided to staff without in an atmosphere that does not condone discrimination and a way that respects their confidentiality. Self-testing by staff members could also be made an option.

2.5.2.1.6 Prophylactic vaccination

Occupational exposure of HCWs to blood-borne HBAs underlines the need for the provision of vaccination to the exposed workers (Aspinall et al 2011:538). Vaccines have been categorised into those that should be given routinely and these include immunisation against hepatitis B, seasonal influenza, rubella, measles, pertussis, varicella and mumps, as well as those for which there is an indication, such as for polio, typhoid and meningococcal (CDC 2011:3). HBV vaccination should be provided to every HCW (Deuffic-Burban et al 2011:6; Lipscomb et al 2009:568) who comes into contact with patients' blood and body fluids and to those nurses who would be entering the Nursing profession to protect them against HBV and related infections. Some HCWs (5-10%) might not be protected through HBV vaccination as they may not show any antibody

response (Deuffic-Burban et al 2011:6). European guidelines for HBV and HCV, as stated in Deuffic-Burban et al (2011:6), suggest that HCWs who do not show response to vaccination would be having antibody levels of less than 10 IU. A response level between 10 and 100 IU, warrants testing for hepatitis B, surface antigen (HbsAg) and Hbc antibodies which will be an indication of existing HBV and HCV infection respectively.

The South African guidelines on HIV Comprehensive Care, Management and Treatment, as stated in Firnhaber et al (2010:[4]), are not inclusive of HBV screening even in cases of co-infection with HIV, thus resulting in the creation of poorly documented prevalence rates, poor tracking of HBV and ineffective vaccination options. Claassens et al (2010:1579) advocate with regard to TB-HIV testing, and for training on TB-HIV that emphasises testing and knowledge of one's HIV status, especially for HCWs working in a high TB laden environment. Good ventilation information should also be given to HCWs in terms of air flow and placement of fans, and ethical challenges need to be highlighted in training, just as the solutions on how to handle the challenges encountered.

A study by Maltezou, Wicker, Borg, Heining, Puro, Theodoridou and Poland (2011:9558) shows that there is a global variation with regards to the vaccination policies of different countries for diseases such as tetanus, pertussis influenza measles, poliomyelitis rubella, varicella, diphtheria, hepatitis A, hepatitis B, meningococcus group C, meningococci groups A, C, W135, Y (tetraivalent vaccine), and tuberculosis (BCG vaccine). Some HCWs opt not to vaccinate for various reasons, and there is a need to encourage them to take responsibility in accessing vaccination, as noted in Seale, Kaur and Macintyre's (2012:[6]) support for the use of incentives to draw HCWs towards vaccination. Tsagris, Nika, Kyriakou, Kapetanakis, Harahousou, Stripeli, Maltezou and Tsolia (2012:39) draw on their study conducted on an influenza outbreak in Greece, to argue that HCWs should be given an annual influenza virus to prevent them from being sources of infection to patients and other colleagues.

2.5.2.2 Secondary prevention of occupational hazards in health care workplaces

The secondary level of prevention focuses on early detection and the management of occupational hazards and risks, and diseases and injuries (GOHNET 2013:6).

2.5.2.2.1 Elimination or substitution

The fundamental interventions seeking to prevent and control hazards, should basically eliminate the hazards, for elimination is the first line of defence (Lunt, Sheffield, Bell, Bennett & Morris 2011:311; Gorman, Dropkin, Kamen, Nimbalkar, Zuckerman, Lowe, Szeinuk, Milek, Piligian & Freund 2013:2). The hazard, at this level of hazard elimination and control, is targeted at its source, with the most significant aspect here being a verification as to whether engineering controls can be utilised to remove the hazard or not, as this can be beneficial in achieving a zero risk. Substitution occurs when elimination controls have not been able to address a particular type of hazard and complete substitution may be the only option. Lunt et al (2011:311) support the notion of the removal of hazards and replacing old with new safer methods in order to prevent and reduce exposure, as opposed to the use of engineering controls.

(i) Work re-assignment

Work re-assignment can also be used to handle a situation involving staff who are HIV infected, as noted by Galgalo et al (2008:952), although worries over the risk of stigmatisation might exist.

(ii) Substitution of chemical agents

There are chemicals that are common in health care and these include germicidal agents, sterilisers and pharmaceutical agents, such as cancer drugs (McDiarmid 2014:315). A chemical like chlorhexidine, which can trigger allergies, should be removed and substituted with non-chlorhexidine hand washes, such as povidine iodine or 70% ethanol (Nagendran et al 2009:272).

2.5.2.2.2 Engineering controls

Technical measures, which involve changing work procedures completely and using safer methods, should be employed in cases where hazard elimination is impossible. If the hazard continues to be uncontrollable, then it should be enclosed or the use of exhaust ventilation would be the next option (McDiarmid 2014:318). Engineering controls need to be built-in within the occupational health and safety management system and this can

take the form of a re-designing of machinery, job tasks or the changing of processes used to justify workers' competencies, in an attempt to curb work-related errors that may result in injuries (Wachter & Yorio 2013:118). Mechanisation, which involves the replacement of an employee with a machine that will do certain jobs, can be used in cases where the risk of injury or error is very high, nonetheless, all measures should be tried out in an attempt to fully eliminate employee exposure to the hazard or to reduce the hazard to a reasonably low level that it would not be likely to cause harm even under continuous exposure (Wachter & Yorio 2013:118).

(i) The control of contaminated or used sharps and needles

NIOSH (2008:2) advocates for the replacement of sharp suturing needles with the blunt-tip needles as a means to reduce percutaneous injuries. Treakle et al (2011:906) and (CDC 2011:1) recommend safety-engineered devices for the disposal of needles and sharps in health care settings, a move that is supported by Feng and Liu (2009:400) who were able to successfully use needle protective devices such as safety syringes, on Taiwanese nurses without a reported incident of NSI. (McDiarmid 2014:318). However, an absence of the safety-engineered devices, demands that work practices should be controlled, with the best example being informing workers to avoid needle recapping. A country such as the USA, has already instituted legislation which enforces employers to supply safety engineered devices for HCWs to help prevent or reduce NSIs (Glenngård & Persson 2009:296; Tosini et al 2010:402).

2.5.2.2.3 Administrative controls

Administrative or organisational controls should come into play after the failure of elimination and substitution controls to reduce exposure of HCWs to hazards, or the engineering controls prove ineffective in attempts to confine the hazards to certain areas (Burton 2010:84). Policy development, good housekeeping and personal hygiene can be employed to help control certain hazards (Burton 2010:84). Managerial buy-in and support are essential to ensure that the duration of exposure is minimised through arrangements of working time, furthermore, the exposure should be limited to a specific number of HCWs per time (Burton 2010:84).

Administrative controls, however, do not eliminate hazards but create a situation that is favourable for the reduction of work-related injuries and diseases (Burton 2010:84). This line of defense would be instituted in a situation where a risk could not be removed, and involves the setting up procedures, practices and policies in an attempt to minimise work-related injuries and diseases. The practices that can successfully reduce some occupational mishaps include worker rotation on a job (Gupta 2013:687), monitoring and minimising the duration of exposure to a risk or hazard, improvements in the immediate working environment, and ergonomic enhancements. Lunt et al (2011:311) support the use of administrative controls as the second line of defence, and identify infection control policies, patient triage, ensuring the availability of human resources and training of HCWs (CDC 2011:1) as some of the administrative policies and practices that can be adopted to prevent and control hazards. Furthermore, they concede to the fact that the 'hierarchy of controls' supersedes the use of personal protective equipment (PPE), though the latter cannot be viewed in isolation as it forms part of the hierarchy.

Finally, good housekeeping is an essential administrative control and workers need to be trained on safe operating procedures (Burton 2010:84). Just as job rotation is essential in order to avoid over-exposure to biological and chemical hazards.

(i) Management interventions

Managers should encourage and promote communication and good interrelations (Utrainen & Kyngas 2009:1005) between them and the workers and promote an open door policy where workers are allowed to come and talk about issues affecting them without prejudice. Psychological and social support from supervisors and co-workers (Burton 2010:30) might also help to lessen the impact of workplace issues that affect female HCWs negatively. The provision of human and material resources, together with that of emotional support from managers, might help ease the heavy burden of work-related challenges and mishaps that female HCWs face. Managers should develop policies that can protect pregnant HCWs in the workplace (Avilés-Palacios et al 2013:27), and therefore need National labour legislation that policies can be relied upon. Finally, managers should be removed or retrained, as this may alleviate issues related to poor leadership and poor interrelations (Burton 2010:84).

(ii) Environmental controls

Facility infection control could benefit from the use of TB isolation rooms (McDiarmid 2014:318) that are fitted with 'ultraviolet germicidal irradiation to inactivate microbes (NIOSH 2009:18). In addition, negative-pressure ventilation, as suggested by Lee et al (2009:1220), can also be used in cases of air-borne infections.

Electrical hazards can be limited by both reducing sources of static electricity, especially in areas such as operating rooms, and that of hazards identified as linked with flammable anaesthesia (Chernovsky et al 2010:19). Sources of electric shock need to be minimised as well in order to enhance fire safety, and fluid spills in operating rooms must receive strict attention in order to prevent shocks to the patient and staff (Chernovsky et al 2010:19).

(iii) Worker involvement in decision making

Worker involvement in decision making can be achieved through managers' support. For example, managers can allow HCWs workers the chance to decide on shift schedules that suit their work-life balance, for as long as patient care is supported and covered twenty-four hours. Thus, workers should be afforded some amount of leverage (Wachter & Yorio 2013:118) with regard to their input towards flexi-time. In addition, workers can also be allowed to make inputs on the timing of work, and preference of area of work (Burton 2010:85).

(iv) Infection control measures

A number of studies (Skodric-Trifunovic, Markovic-Denic, Nagorni-Obradovic, Vlajinac & Woeltjie 2009:641; He, Wang, Chai, Klena, Cheng, Ren, Pen, Gao, Li, He, Li, Wang, Rao & Varma 2012:1490; Galgalo et al 2008:952) underline the need to give attention to infection control practices. Low cost infection control measures can be adopted in order to minimise the spread Mycobacterium tuberculosis, especially in cases involving undiagnosed or unconfirmed patients and those who have not been initiated (Galgalo et al 2008:952). Health care settings can also separate coughing from non-coughing patients even before a confirmed diagnosis of TB. Compliance to hand hygiene (Deuffic-Burban et al 2011:5) by HCWs and by patients themselves, the screening of HCWs and

taking environmental swabs, are highlighted by Danzmann, Gastmeier, Schwab and Vonberg (2013:[3]) as some of the infection control measures that need to be emphasised and supervised.

(v) *Post exposure prophylaxis*

Post exposure prophylaxis (PEP) should be provided for protection against HIV infection (Kuhar, Henderson, Struble, Heneine, Thomas, Cheever, Gomaa & Panlilio 2013:880; Lipscomb et al 2009:568; Deuffic-Burban et al 2011:6) in the event following exposure to any source of infection, even though Deuffic-Burban et al (2011:6) refute PEP, especially if the HCW has been previously vaccinated and had an antibody response. However, the major challenge pertains to the lack of prophylaxis for HCV vaccination and HIV, although both have effective treatment available if identified timeously.

Improved and supportive communication for nurses on PEP that promotes compliance to treatment is crucial (CDC 2011:2). TST is suggested as the first-line test to rule out TB infection (Tshitangano 2013:14) among HCWs. Rifampicin prophylaxis has been encouraged for nurses with positive TST in a study by Lee et al (2009:1221), which shows that, although the uptake of chemoprophylaxis among HCWs varied with each different setting, those that had a high TB prevalence, demonstrated no acceptance (0%) of chemoprophylaxis among HCWs, compared to a 65-84% acceptance in a low TB prevalence setting. HCWs workers with zero acceptance of chemoprophylaxis were encouraged to report symptoms and accept evaluation for active TB disease (Khawcharoenporn et al 2011:16; Claassens et al (2010:1579). An algorithm of TB screening among HCWs can help with early detection and management, and BCG vaccination needs to be enhanced. Treatment should be initiated when screening tests are positive and adherence counselling needs to be provided too. Similar to Lee et al (2009:1221), the use of isoniazid (INH) by HCWs as prophylaxis is discouraged (Khawcharoenporn et al 2011:16) due to its adverse effects, low acceptance and low completion rate. Nevertheless, INH use is supported by Claassens et al (2010:1579) as a 'preventive treatment programme.

(vi) *Workload management*

Workload management can be engineered by the introduction of work processes and procedures that assist with successful and timeous task management (Burton 2010:31); job restructuring (Jayakumar & Kalaiselvi 2012:146); job rotation and job enrichment (Gupta (2013:687). In addition, Clarke and Brooks (2010:302) propose a work design dimension for managing workload in the work environment.

(vii) *Use of assistive devices*

Assistive devices, such as sliding sheets, height adjustable beds and baths lateral transfer boards, could be used to reduce the severity and frequency of MSDs among HCWs (D'Arcy et al 2011:837; Tullar et al 2010:200). The research findings in D'Arcy et al (2011:842) suggest that 10.3% of HCWs sustain an injury in the presence of assistive devices, with the non-availability of devices resulting in the injury rates increasing to 16%. The use of lifts to transfer patients was noted as yielding a two-thirds (2/3) reduction in stress on the lower back of nurses. This is evident in the 'zero-lift' programme, which was adopted at several facilities to replace manual handling, and resulted in a reduction in injuries among HCWs (D'Arcy et al 2011:837; Tullar et al 2010:200).

Nevertheless, a study by Kothiyal and Yuen (2004), cited in D'Arcy et al (2011:837) disputes the role played by assistive devices in achieving reduction in pain and stress on the lower back, and states that the devices could instead increase the number of injuries. Interestingly, Engkvist et al (2000) cited in D'Arcy et al (2011:837), support the use of assistive devices as long as training in their use is provided.

(viii) *Multi-component patient-handling interventions (MCPHI)*

The term multi-component patient-handling interventions (MCPHI), as cited in Tullar et al (2010:200), means that the MCPHI interventions use intertwined components:(i) institutional policy that addresses the reduction of injuries associated with patient-handling; (ii) the procurement of patient transfer or patient lifting equipment; and (iii) provide training that broadly encompasses patient handling and the usage of equipment. For their effectiveness, the three components cannot be split and have to be used

concurrently in this approach. A review of the MCPHI found out that it was positively but moderately linked to MSD improvement (Tullar et al 2010:211).

(ix) Personal health services

Personal health and support services need to be provided to workers. An environment that is supportive to the health needs of female HCWs is required, and should be provided in the form of medical services, facilities, training, information provision, and support through policy, flexible work hours as well as promotional programmes that assist workers to develop and sustain healthy lifestyles (Burton 2010:86). Structural empowerment is referred to by Lautizi et al (2009:447), as the availability of social structures within the work environment which workers can access to capacitate and help them to achieve personal and organisational goals. Therefore, psychological support and counselling by a professional is another measure that can help to alleviate the impact of psychological stressors, as indicated by Padayatchi, Daftary, Moodley, Madansein and Ramjee (2010:964).

2.5.2.2.4 The use of personal protective equipment (PPE)

Certain risks can never be removed in health care, as they are intrinsic characteristics of the work done by HCWs. These risks include air-borne and blood-borne pathogens that exist in the environment in which a HCW works. The use of personal protective equipment (PPE) and protective clothing in this given situation becomes the third line of defence (Lunt et al 2011:311), although it is not the least in the 'hierarchy of controls' as it cannot be separated from the other controls.

The provision of PPE to workers is the employer's responsibility. PPE is issued to workers as a means of supplementing other control measures in place (Burton 2010:84). The effectiveness of PPE relies on how compliant and cooperative the workers are in using it. Lombardi, Verna, Brennan and Perry (2009:757) identify worker characteristics and their perceptions on the workplace hazards as influencing their decision to use PPE. Therefore, the use of PPE is a required condition of employment and should not be reliant on worker decision.

The various types of PPE applicable in health care workplaces include:

(i) *Gowns and coveralls*

Gowns and coveralls are protective clothing that is used in the protection against HBAs (NIOSH 2015). However, their use should be guided by the type, size and shape of microorganism, the type of fabric, carrier characteristics and external factors, such as temperature and chemical factors. PPE designs should also be the right fit for FHCWs and employers should avoid PPEs with standard fitting sizes (Walker 2010:30).

(ii) *Face masks*

A study conducted by Dharmadhikari, Mphahlele, Stoltz, Venter, Mathebula, Masotla, Lubbe, Pagano, First, Jensen, van der Walt and Nardell (2012:1107), established that the patients' use of surgical face masks in the prevention of TB, MDR-TB and XDR-TB is effective, as the risk of airborne transmission was reduced 2.3-fold (56%). The research findings demonstrate that patients infected with MDR-TB with or without HIV emitted 138 quanta in the ward when not wearing face masks, unlike the 34 quanta that was emitted by the same patients when putting on face masks. The study provides evidence of the reduction of TB transmission through the use of face masks.

(iii) *(N95) Respirator*

Anyone coming into close contact with TB infected patients, i.e. HCWs and the patients' visitors, need to use the N95 respirator (Lee et al 2009:1221). Staff members who have seroconverted need to be provided with their 'personal respiratory protection' (Galgalo et al 2008:952), especially if they have direct contact with patients (Lee et al 2009:1220). Claassens et al (2010:1579) also encourage the provision of respirators (N95) for use by staff and surgical masks to be provided to TB suspects and patients. The 3M N95 respirator is also recommended for influenza strains like PH1N1; the North American swine (H3N2 & H1N2); A/Brazilian/11/78 (H1N1) and the A/PR/8/34 (H1N1), as that are 95% efficient in protecting HCWs against viruses (Coulliette et al 2013:2153).

(iv) *Surgical hand gloves*

Lipscomb et al (2009:564) support both the use of PPE by HCWs in the event of exposure to blood-borne hazardous biological agents (HBA) and a consistent wearing of gloves. Hence, there should be adequate supplies of protective gloves. In addition, training on the use of PPE is essential to achieve desired outcomes of usage.

The study by Nukui et al (2012:60) bears evidence to the importance of using personal protective equipment (PPE) in the workplace. The study found out that doctors and nurses who had direct contact with patients presenting with influenza-like symptoms but had failed to use personal protective equipment (PPE), i.e. surgical masks or gloves or gowns, had high antibody levels for H1N1 compared to those who had used PPE.

2.5.2.3 Tertiary prevention of occupational hazards in health care workplaces

Tertiary prevention measures are geared at promoting and capacitating workers to return to work post injury or illness, as it deals with rehabilitating workers to resume duties (GOHNET 2013:6).

2.5.2.3.1 Rehabilitation and Return-to-work (RTW) programmes

A return-to-work (RTW) strategy that uses a multidisciplinary approach at out-patient care level was developed by Buijs et al (2009:66) to help workers with back ache to return to work sooner or to help them maintain their quality of life and alleviate financial suffering. The authors state that the programme is not a conventional pain reduction strategy that encourages immobilization to achieve pain relief, but rather, encourages individuals to be active in their daily life chores, including job activities, to promote functional capability. The findings from the research revealed success in changing the mind set of pain reduction to that of RTW among the affected and health care personnel, though despair was a negative barrier towards achieving desired results in certain participants (Buijs et al 2009:68).

2.6 CONCLUSION

The chapter focused on the various occupational health hazards experienced by HCWs located in the health sector. It provided an overview of legislation applicable over occupational health and safety matters that are relevant to health care workplaces. The biological, physical, chemical, ergonomic and psychosocial hazards were described together with their impact on the well-being of the HCWs. The chapter also reviewed the management of hazards through the hierarchy of controls.

The next chapter discusses the theoretical basis of the study.

CHAPTER 3

THEORETICAL FRAMEWORK

3.1 INTRODUCTION

This chapter outlines the theoretical framework, the World Health Organization Healthy Workplace Framework and Model, underpinning this study (WHOHWFM) (Burton 2010:82). The chapter also defines a healthy workplace and describes the avenues of influence for a healthy workplace and the core principles of the model. The WHOHWFM serves as a global guide that employers and employees can use as a practical yardstick to promote healthy and safe workplaces. The WHOHWFM is embracive of the various types and nature of workplaces. It provides a grounding for both the development of data collection tools and practical guidelines, which are the primary outputs of the study.

3.2 THEORETICAL FRAMEWORK OF THE CURRENT STUDY

The WHO's Healthy Workplace Framework and Model is a document designed to guide occupational health professionals and provide them with a scientific basis towards structuring healthier workplaces (Burton 2010:1). The term 'framework' in the WHOWFM, refers to a description of key aspects (avenues of influence; and core principles) and provides an interpretation of the model for healthy workplaces. In addition, the term 'model' refers to the abstraction of the concept 'healthy workplace' in relation to its structure, content and process components (Burton 2010:1), as depicted in figure 3.1.

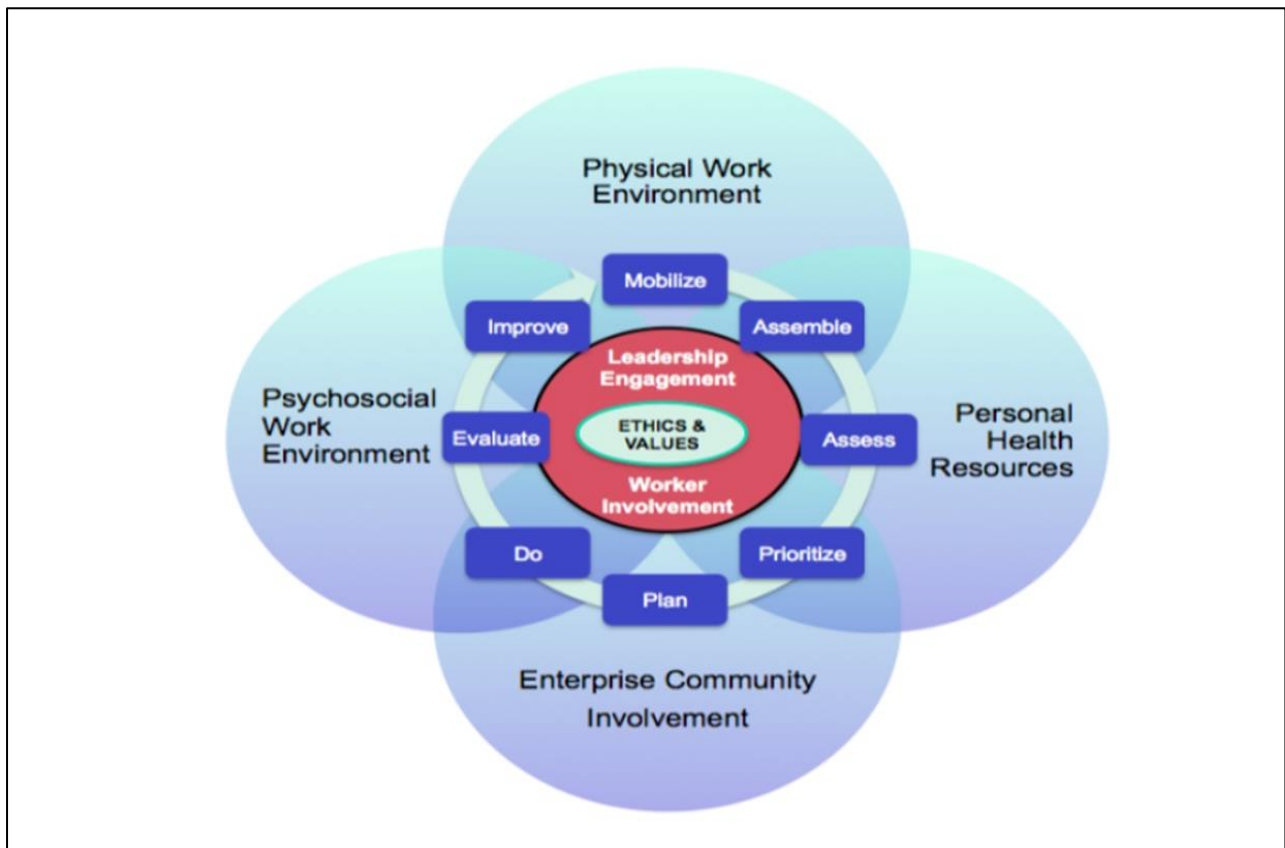


Figure 3.1 The WHO Healthy Workplace Framework and Model

(Burton 2010:98)

3.2.1 Definitionn of a healthy workplace

The World Health Organization defines a healthy workplace within the context of the WHOHWF as:

“A place where everyone works together to achieve an agreed vision for the health and well-being of workers and the surrounding community (Burton 2010:15). The WHOHWF provides all members of the workforce with physical, psychological, social and organizational conditions that protect and promote health and safety. Furthermore, it enables managers and workers to increase control over their own health and to improve it, and to become more energetic, positive and contented” (Burton 2010:15).

The WHOHWF is the foundation for the current study due to its relevance and role in advocating for occupational health and safety. In particular, it promotes OHS for workers

globally and across all sectors. It identifies workplace hazards and the management in an attempt to establish a safe and healthy workplace. The WHOHWFMM identifies factors within the physical and psychosocial work environments, which hamper a good and safe work life within workplaces.

As a result, the current study seeks to unpack the occupational health and safety challenges that affect health care workers. The study includes the physical, psychological and social issues that pose as health challenges among HCWs and hopes to suggest ways in to enhance health and safety promotion. The ultimate aim is to foster a good quality of life among health care workers. The framework and model thus provides a relevant base from which to investigate challenges experiences by the HCWs at the Tshwane District Public Hospitals, as they face similar hazards inherent within the South African and global healthcare environment.

3.2.2 Components of the WHO Healthy Workplace Framework and Model (WHOHWFMM)

The WHOHWFMM comprises of three components, which are: (i) the content, also referred to as the avenues of influence for a healthy workplace; (ii) the process; and (iii) the core principles around which the model is centred (Burton 2010:98). The content component and core principles of the WHOHWFMM are the focus of discussion for the current study.

3.2.2.1 Avenues of influence for a healthy workplace: the content component

The content component of the WHOHWFMM comprises of (i) the physical work environment; (ii) psychosocial work environment; (iii) personal health resources in the workplace; and (iv) the enterprise community involvement, which are collectively called the avenues of influence (Burton 2010:83). The avenues of influence for a healthy workplace, as described in the WHOHWFMM in Burton (2010:83), are strategies through which organisations and workers should influence the achievement of health and safety for workers and organisations, thus ensuring protection and promotion of the physical and psychosocial wellness of workers (Burton 2010:83). Figure 3.2 is a modification of the four avenues of influence identified in the WHO Healthy Workplace Framework and Model (WHOHWFMM).

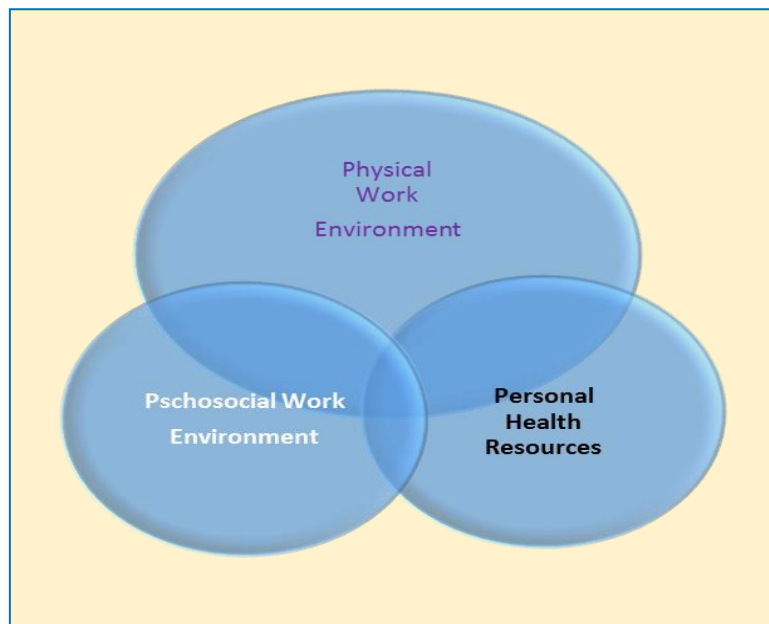


Figure 3.2 Adaptation of the WHOHWFM: Avenues of Influence for a healthy workplace
(Burton 2010:83)

While the WHOHWFM consists of four avenues of influence for a healthy workplace, only three of the four avenues are relevant for this study, and these (the physical work environment, psychosocial work environment and personal health resources) are included in this discussion. The three avenues of influence are relevant to the study and appropriate the context within which the study investigates challenges of health care workers (HCWs) in the Tshwane Healthcare District’s public hospitals. The avenues of influence for a healthy workplace, as described in the WHO Healthy Workplace Framework and Model (WHOHWFM), are interrelated and some occupational health issues spill over from one to the other avenue, as described hereunder:

3.2.2.1.1 The physical work environment

The WHOHWFM defines the physical work environment as the physical space where workers are exposed to products, machinery, polluted air, chemicals, biological agents and work processes, and including the structure of the workplace (Burton 2010:83). Clarke and Brooks (2010:302) refer to the physical work environment context as “the work setting wherein nurses practice and the impression of the work environment on the nurses’ lives”. Factors within the physical work environment may have a negative influence on the health of the workers and give rise to physical and psychosocial health

and safety problems (Burton 2010:83). Berninger, Webber, Weakley, Gustave, Zeig-Owens, Lee, Al-Othman, Cohen, Kelly and Prezant (2010:1474) note that the physical work environment encompasses various hazards, including biological hazards, which result in physical ill health of HCWs, manifesting as occupational diseases. Occupational injuries, such as back injuries and sprains, among HCWs emanate from physical and ergonomic hazards, which prevail within the physical work environment (Grobler 2013:210).

The physical work environment may, however, be influenced positively. This positive influence includes collaborative effort towards hazards and risk reduction, and an improvement of the work environment to yield beneficial health results for workers (Burton 2010:96) as well as reduce occupational mishaps. Burton (2010:84) reiterates that the physical aspects of the work environment have a bearing on worker wellness, thus either lowering or promoting the quality of life experienced at work.

The WHOHWFM highlights examples of hazards in the physical work environment and proposes hierarchies of control to curb the hazards (Burton 2010:84), as described below:

(i) Common hazards within the physical work environment

The WHOHWFM, in Burton (2010:84), describes the physical work environment as consisting of the physical, chemical, mechanical, ergonomic, safety, violence at work and biological hazards as outlined below:

Physical hazards

Physical hazards are non-biological hazards emanating from the physical work environment, which have the potential to cause injuries and diseases (Ndejjo et al 2015:[3]). The WHOHWFM encompasses aspects such as exposure to radiation and extreme temperatures within the work environment and these pose dangers to workers' physical health (Burton 2010:84). Health care workplaces, the setting for the current study, harbour radioactive material, which may be present in liquid biomedical waste (Biswal 2013:100).



Chemical hazards

Chemical hazards result from exposure to chemical agents such as solvents, solutions, pesticides and insecticides as noted by the WHOHWFM (Burton 2010:84). HCWs are exposed, in health care settings, to chemicals such as disinfectants, antimicrobials, solutions and latex powder from the use of rubber gloves, with the likelihood of causing allergic reactions (Nagendran, et al 2009:270). Toxic drugs and liquid biomedical waste, such as mercury, are further examples of chemical hazards prevalent among HCWs that put the lives of HCWs in danger (Biswal 2013:100).

Mechanical hazards

Mechanical hazards, as described by the WHOHWFM in Burton (2010:84), pertain to the interface between workers, machinery and equipment, and the effects of faulty machinery on the health of the workers. In the case of health settings, the use of machinery or equipment may be of danger to HCWs if there is improper usage resulting from poor or lack of training (Tullar et al 2010:200). The WHOHWFM proposes that mechanical hazards may be enhanced by continuous exposure to machinery (Burton 2010:84), whereas Wachter and Yorio (2013:118) support the notion by suggesting less or no exposure of the worker to dangerous machinery to minimise harm.

Ergonomic hazards

The WHOHWFM describes ergonomic hazards as dangers involving the use of excessive force, awkward posture when performing certain tasks, and performance of repetitive work (Burton 2010:84). Examples of ergonomic hazards at health care workplaces include cases where HCWs engage in activities that are labour intensive or involve manual material handling such as turning, lifting heavy patients whilst adopting awkward positions, prolonged standing, repetitive movements and working long hours (D'Arcy et al 2011:837; Schoenfisch & Lipscomb 2009:117).

Safety hazards

Burton (2010:84) describes safety hazards in the WHOHWFM as those related to electrical sparks resulting in electrocution, and the slips, trips and falls (STF) resulting in

musculoskeletal disorders (MSDs). In the case of health care workplaces, the STF occur due to liquid spills, stock piles, and loose lying electric cords which may result in injuries (McDiarmid 2014:316; Chernovsky, et al 2010:5). Operating rooms have been found to have frequent electrical hazards. As a result, Chernovsky, et al (2010:19) suggest that static electricity and flame producing hazards, such as flammable anaesthesia, need to be reduced in the operating rooms (Chernovsky et al 2010:19).

Violence

The WHOHWM cites violence and lack of safety in workplaces as examples of the hazards commonly found in the physical work environment (Burton (2010:84). Easton and Van Laar (2012:17) highlight that the physical work environment should provide safe working conditions and resources that promote the safety of the environment (Jayakumar & Kalaiselvi 2012:146). Other studies also argued that the emergence of violence in the physical work environment is an occupational health hazard which renders the healthcare workplace unsafe (Kowalenko, Cunningham, Sachs, Gore, Barata, Gates, Hargarten, Josephson, Kamat, Kerr & McClain 2012:523; Chen, Huang, Hwang & Chen 2010:1156). Kowalenko et al (2012:523) further advocate for the prevention and eradication of violence in the health sector through policy development and feasible practical approaches.

Biological hazards

The WHOHWM also describes biological hazards as disease-causing agents, which exist within the physical work environment (Burton 2010:83). Berninger et al (2010:1474), in concurrence with the previous statement, describe biological hazards as causing occupational diseases that lead to physical ill-health. The biological hazards include hepatitis B, HIV, pandemic threats, hepatitis C, and circumstances, such as lack of toilet and hygiene facilities, which lead to the existence and sustenance of biological hazards. In addition, and relevant to the context of the current study, Knoeller, Mazurek, and Moorman (2012:776) state that occupational disease characteristics among HCWs arising from hazardous biological agents (HBAs), cause breakdowns in the physical functionality of the workers due to ill-health. This is corroborated in studies on occupational tuberculosis among health care workers and occupationally acquired blood-borne conditions, such as hepatitis and AIDS, respectively, which all attest to HCWs' poor

physical functionality due to ill-health resulting from HBAs (Zungu & Malotle 2011:17; Dény & Zoulim 2010:246; Abuelhassan 2012:94). Finally, Berninger, et al (2010:1474) show the link between respiratory ailments, such as asthma and chronic cough, and HBAs existing in the physical work environment.

(ii) Hazard control within the physical work environment

Burton (2010:84) states that the physical work environment safety and an eradication of risk to health are achievable through the institution of various measures that minimise exposure to hazards, which result in occupational injuries and diseases. A number of measures, which include: (i) hazard identification; (ii) an assessment of hazards (type and magnitude); and (iv) the control of hazards (hierarchy of controls), can influence and render the physical work environment healthy and safe (Burton 2010:84). The WHOHWFM describes the hierarchies of control, as measures that include substitution or elimination of hazard causing phenomena; engineering controls; administrative controls; and the use of personal protective equipment (Burton 2010:84), as discussed below:

Elimination or substitution

Elimination or substitution involves the complete removal of a hazardous agent and its replacement with one that is less or not toxic (Burton 2010:84). An example for HCWs would be the removal latex gloves and replacing them with powder-free gloves for those HCWs experiencing latex allergy (Burton (2010:84).

Engineering controls

Engineering controls refer to altering existing systems, processes or machinery to minimise the occurrence of injuries or diseases (Burton 2010:84). The replacement of ventilation systems that remove air filled with air-borne hazardous agents with clean ventilated air to minimise the spread of tuberculosis (TB) and the use of safety engineered needle systems are prime examples of such measures (Burton 2010:84).

Administrative controls

Administrative controls that maintain good housekeeping result in the promotion of a safe and healthy physical work environment. Cleanliness within the environment promotes hygiene and minimises the spread of diseases, whilst tidying up of the environment ensures well-packed equipment and stock as well as avoid injuries (Burton 2010:84). Good housekeeping involves worker training on procedures and systems and machine maintenance (Burton 2010:84). The rotation of workers is also a housekeeping measure that can reduce workers' exposure to hazardous environments for a longer period (Burton 2010:85).

Personal protective equipment (PPE)

The WHOHWFMM proposes the use of PPE as one of the intervention measures that protect workers against contamination from pathogenic material (Burton 2010:85). Similarly, the South African legislation obligates employers to provide PPE by to their employees, through the Occupational Health and Safety Act, 1993 (Act No. 85 of 1993) as amended (OHS Act, 1993:8). In the current study, hazardous pathogens in the health care physical work environment are inherent in the daily duties of HCWs, and warrant the use of PPE. PPE use, in conjunction with other hazard control measures, such as elimination, substitution, engineering and administrative controls, is the last line of defence against exposure to workplace hazards (Lunt, et al 2011:311). Finally, it is important that provision of personal protective equipment (PPE) should consider the make and size of the protective gear for both genders when procuring the PPE (Burton 2010:85).

3.2.2.1.2 The psychosocial work environment

The WHO Healthy Workplace Framework and Model outlines beliefs, values, work practices, the culture of the organisation and work organisation as some stressors within the psychosocial work environment that impact on the psychosocial and physical health and safety of workers as well as give rise to various types of mental or emotional strain (Burton 2010:85). The hazards found within the psychosocial work environment are discussed below:

(i) *Hazards within the psychosocial work environment*

The WHOHWFM cites the examples of hazards in the psychosocial work environment. The salient features highlighted in this regard are:

Organisational culture

Burton (2010:85) suggests that, based on the WHOHWFM, there are few or no policies that specifically target the promotion of respect and dignity of workers; condemn violence-related acts; and support healthy lifestyles. The culture of the organisation needs to foster practices that ensure the respect of workers. Acts of violence, such as harassment and bullying, should be addressed through policy formulation and implementation to protect vulnerable workers. Finally, policies that protect workers against discrimination based on their gender and other personal orientations should exist (Burton 2010:85).

Shift work

The WHOHWFM proposes that shift work is associated with psychological stress among HCWs and contributes to changes in sleeping patterns (Burton 2010:85; Kleiner & Pavalko 2010:1464), and physical health problems, such as fatigue and sleepiness (McClelland et al 2013:60; Knutson & Bøggild 2010:87). Shift work related-stress is exacerbated by workplace violence, which is noted as taking place more during the night shift than during the day (Nabe-Nielsen, Tüchsen, Christensen, Garde & Diderichsen 2009:52). Relevant to the current study is the fact that HCWs in the participating hospitals work on a shift basis and are most likely to experience shift work-related challenges identified in the WHOHWFM.

Lack of support from management

Burton (2010:85) proposes, basing on the WHOHWFM that, lack of support from management towards workers, and failure to protect workers' rights regarding hours of work, and occupational health and safety rights, may contribute towards psychological hazards. Lack of support for the occupational rights of workers over long hours of work (Burton 2010:85; Al-Qutop & Harrim 2011:197) and the denial of the right to be medically assessed, and to work in a safe and healthy work environment as stipulated in OHS

legislation is a source of psychological stress (Burton 2010:85). HCWs workers also lack support in the quest for work-life balance (Burton 2010:85).

Type of management style

The WHOHWFM states that management style that does not promote consultations with the workers and is not open to two-way communication between management and workers stands as a major occupational stressor (Burton 2010:85). Leaders should take a lead in fostering good relations in the workplace (Spence-Laschinger 2010:875; Davey, Cummings, Newburn-Cook & Lo 2009:322). The current study investigated the impact of management practices on the promotion of occupational health and safety among HCWs in the Tshwane Healthcare District's public hospitals, and suggested ways to curb the existing poor managerial practices.

(ii) Hazard control within the psychosocial work environment

The WHOHWFM proposes that the handling of psychosocial work stressors should follow some of the generic hierarchies of control, elimination, substitution and administrative controls, and apply them in the physical work environment (Burton 2010:85). Workplaces can use surveys and interviews as an alternate to physical inspections during attempts at hazard identification (Burton 2010:85). The training of workers on coping skills and the handling of conflict situations may also help alleviate occupational stress and empowers workers with skills in how to cope with stressful situations in the future (Burton 2010:86).

3.2.2.1.3 Personal health resources in the workplace

Personal health services in the workplace, as proposed in the WHOHWFM, refer to the provision of health resources, opportunities, information and other personal resources in order to create supportive environments (Burton 201:86). The services motivate workers to improve and maintain healthier lifestyles, as lifestyle modification is dependent on knowledge and information provision (Burton 2010:86). Workers employed at organisations that have no information may find themselves in difficulties regarding the making of healthier lifestyle choices (Burton 2010:86). This domain of the WHOHWFM supports the current study, which explored whether HCWs working in public hospitals in

the Tshwane Healthcare District were provided with the necessary personal health services and information to support their well-being at work.

(i) Hazards within the personal health resources domain

The WHOHWFM identifies some of the hazards, in a commentary on personal health issues in the workplace, in Burton (2010:86) as:

- Poor sleep quality and quantity due to occupational stress, long hours of work, shift work and increased workloads (Burton 2010:86). Other studies highlight, in support that, altered patterns of sleep can be as a result of heavy workloads and long hours of work, respectively (Bolge, Doan, Kannan & Baran 2009:415; Caruso & Hitchcock 2010:192). The current study investigated the occurrence of long hours of work and increased workloads among HCWs and their impact on their physical and psychological health.
- Lack of accessibility to health care resulting in undiagnosed and untreated medical conditions (Burton 2010:86). In the present study, the researcher investigated accessibility and provision of personal health resources such as family planning and reproductive health assessments for HCWs.

(ii) Hazard control within the personal health resources domain

The promotion of health, as suggested by Burton (2010:87) in the WHOHWFM, requires the application of hierarchies of control in the psychosocial work environment. This will result in a positive influence towards the organisations' provision of personal health resources (Burton 2010:87). Hazard control in this domain is mainly administrative and includes:

Provision of health services and facilities

The WHOHWFM suggests that worker counselling services assist in alleviating occupational and personal stress levels (Burton 2010:87). It also suggests the provision of efficient medical assessments for workers as mandated by OHS legislation for the prevention, early detection and early treatment of occupational diseases (Burton 2010:87). Finally, encourages the establishment of food services that provide healthier

options to prevent obesity or poor nutrition, and that of facilities such as gym and fitness improvement initiatives in the workplace are required to inspire workers to engage in active physical and healthy practices (Burton 2010:87).

Enforcement of rest periods

Fatigue and burnout may occur among HCWs as a result of extended hours of work, thus creating further physical health problems such as poor sleep patterns and heart conditions (Stimpfel et al 2012:2501; Knutson & Bøggild 2010:87). The WHOHWFM proposes that workers should have physical and mental rest (Burton 2010:87). Proper tea and lunch breaks should be enforced during break times, and workers should be encouraged to exercise so that they can re-vitalise themselves (Burton 2010:87).

Training and information

The provision of training and information regarding management of finances, good eating habits and cessation of smoking can help workers to make informed personal choices. Worker support in the form of training, dissemination of appropriate information and invitation of health lifestyle experts to address workers is also necessary (Burton 2010:87). Finally, the provision of information regarding counselling, abuse of alcohol and drugs in the workplace is requisite (Burton 2010:87).

Provision of options to suit personal needs

The WHOHWFM identifies work schedules as one of the hazards affecting the personal health needs and choices of workers (Burton 2010:86). The WHOHWFM proposes that workers be afforded a reasonable extent to make personal choices regarding flexible work and be allowed a preference in the choice of shifts, all of which are enabled through the development of healthy shift work policies that promote flexitime (Burton 2010:87). This resonates with the current study as it explored HCWs' concerns regarding the structuring of working hours and shifts, and the way these influenced their occupational and social well-being. The provision of personal options for flexi hours to suit the HCWs' personal needs and lifestyles reflects work environment social structures that strive to alleviate personal stress and foster a supportive environment (Burton 2010:86; Lautizi, et al 2009:447; Padayatchi et al 2010:964).

Creation of supportive work environments

Burton (2010:87) suggests the creation of supportive work environments that enable workers to access personal health facilities such as family planning services, and cancer diagnostic services such as PAP-smears and mammograms, over and above those provided in the general medical surveillance. This endeavour may prevent psychological stressors resulting from lack of personal health information and services. The availability of family planning services on site would be advantageous and provide a measure of security for HCWs that their personal health needs can be met within their workplaces, without having to seek help outside of their workplace (Burton 2010:87). Based on the WHOHWFM, as the theoretical underpinning the current study, the researcher sought to investigate whether the personal health needs of HCWs were supported through the provision of required health resources to foster their well-being in the workplace. Burton (2010:86) underscores that personal health resources pertain to the support that the institution gives to its workers in the form of information, health services and any enhancement to assist workers to maintain healthy personal life practices with a view to promote their health and safety at work.

3.2.2.2 Core principles of a healthy workplace

The core principles of the WHOHWFM are the engagement of leadership and involvement of workers (stakeholder collaboration); and the ethics and values around which institutional work relations should be based (Burton 2010:98). The fostering of stakeholder collaboration and good ethics ensures a healthy workplace that will enhance the general safety of workers (Burton 2010:98).



Figure 3.3 Adaptation of the WHOHWFM: Core principles of a healthy workplace
(Burton 2010:98)

3.2.2.2.1 Stakeholder collaboration

According to the WHOHWFM, organisations and their workers are required to collaborate through the engagement and involvement of leadership and workers towards achieving the health and safety needs for all concerned in the respective workplace (Burton 2010:5; Wachter & Yorio 2013:118). A concerted effort from workers, employers and other stakeholders, such as organised labour, creates a healthy workplace. Clarke and Brooks (2010:302) argue, in concurrence with this view that, good interrelations and working together at work brings benefits to stakeholders in the form of a healthy, safe and happy workforce that is productive, enhances organisational growth and success and encounters less conflicts and litigations (Smith, Andrusyszyn & Spence-Laschinger 2010:1005; Burton 2010:84). The Emergency Nurses Association (2013:1) also supports the mutual relationship between managers and workers. The mutual relationship should support a healthy work environment that supports no prejudice and emphasise senior personnel and in particular senior management's taking the lead in becoming the role models to enhance values of mutual respect and understanding of all staff (Emergency Nurses Association 2013:1).

In addition, the Occupational Health and Safety Act, 1993 (Act No. 85 of 1993) as amended, stipulates that leadership within the organisation has an obligation to protect workers through the implementation of physical safety measures and demonstrate this by assuming leadership towards health and safety promotion in the workplace (OHS Act, 1993:8; Emergency Nurses Association 2013:1). In the same breadth, workers should reciprocate by taking responsibility towards others and their own health and safety, Act, No. 85 of 1993, as amended (OHS Act, 1993:10). Jayakumar and Kalaiselvi (2012:149) state that workers are valuable and should be engaged in matters of the organisation that relate to the promotion of health and safety. Thus, organisations should provide conducive environments wherein workers can be productive and reap rewards for themselves and the organisations they work for (Jayakumar & Kalaiselvi 2012:149). This researcher's current study probed into the relationship between HCWs and nurse managers and the impact this had on the promotion of health and safety at work.

3.2.2.2.2 Ethics and values

The core of the WHOHWFM is the ethics around which the organisation bases its business with its workers (Burton 2010:97). Management's commitment is key to ensuring a healthy workplace and realising the significance of its workforce involvement in matters of health and safety promotion. Gayathiri and Ramakrishnan (2013:1), Drobnič, Beham and Präg (2010:207), and Royuela, López-Tamayo Suriñach (2009:226) are in agreement with the humanistic ethical approach in the WHOHWFM, as they advocate for a humanistic approach towards work, though the latter two authors also support the monetary benefit of work. Good interpersonal relationships among workers and management are ethically correct and vital for the psychological well-being in the workplace (Stephen & Dhanapal 2011:64; Utriainen & Kyngas 2009:1005; Gupta 2013:687). Sound business draws on good work ethics and showing respect, gratitude, recognition, value and dignity towards the workers (Milton 2010:288). The concept nurse dignity is associated with the nurses' experiences of a satisfying life in their work, and described as a concept related to and solidly established in one's self-esteem, self-respect, conduct and pride (Milton 2010:288). Thus, dignity as applicable to nurses implies the nurses' self-worth and the fact that success in their work life, is indicative of how well they have lived.

The WHOHWFM espouses that good work ethics are central to workers and employers working together towards a healthier environment (Burton 2010:97), and “value” is one such ethical requirement (Kuehn 2010:195). Dissatisfactions among nurses occur due to ‘non-caring work experiences’ and the ‘non-supportive work environments’ and these result in some nurses’ intentions to leave their present employment so that they can be valued somewhere else (Kuehn 2010:195). Ethical challenges, manifest in factors such as abuse, overwork and limited autonomy, impact negatively on the dignity of nurses (Milton 2010:288). A psychologically healthy life is viewed by nurses as pertaining to their ability to provide competent ethical services to their patients, and work that is physically managed and psychosocially meaningful (Milton 2010:288). One’s success in their work is a landmark of a life well lived.

Nonetheless, the promotion of nurse dignity and self-worth requires nurses to be involved in a meaningful way to feel and experience autonomy in a workplace that is supportive and cooperative (Milton 2010:288). The reduction of unethical behaviour in any setting Barofsky’s (2012:633) requires a ‘do no harm’ approach and an ‘ideal and positive outcomes’ approach to thwart antagonistic experiences by workers. Milton (2010:288) argues that nurses need respect, gratitude, recognition, value and dignity, so that they can feel valued and thus contribute towards a collaborative effort.

3.3 CONCLUSION

The chapter focussed on the WHOHWFM as the framework and foundation of this study, as it relates to the promotion of health and safety among workers. It defined a healthy workplace and explained the WHOHWFM’s component parts, which include the three avenues of influence towards a healthy workplace promotion and the core principles of a healthy workplace.

The chapter also discussed the avenues of influence in relation to achieving a healthy and safe environment for workers. The discussion included further the hazards identified within the physical work environment; the psychosocial work environment and the personal health resources domain in the workplace; and how the hierarchies of control can eliminate or reduce the hazards. It is evident that the core principles of the WHOHWFM addressed the managers and workers’ collaborative action in working

towards achieving a healthy workplace. The chapter also highlighted the relevance of the WHOHWFM to the focus of the study.

The next chapter describes the research methodology and provides an explanation of the methods followed during the current study.

CHAPTER 4

RESEARCH METHODOLOGY

4.1 INTRODUCTION

This chapter discusses the research methodology used for the study. The paradigmatic approach and the research design used in the study are explained in this chapter. The chapter further explains the method(s) used for data collection including a description of the study setting, the target population, sampling method and sample size, and data analysis method(s). Measures for promoting the validity and reliability of the study are discussed as well as ethical principles that were complied with during the execution of the study.

4.2 RESEARCH DESIGN

4.2.1 Research paradigm

The quantitative research paradigm is used to test the empirical world using structured, formal and systematic approach to provide a description of variables (Grove et al 2013:41). In this study, a quantitative approach was adopted to investigate occupational health challenges and their impact on the well-being and safety of HCWs in selected public hospitals in Tshwane healthcare district. This paradigmatic approach provided direction of thinking and interpretation of reality within the paradigm conceptual boundaries (Fain 2013:215).

Deductive reasoning applied in this paradigmatic approach was demonstrative of the fact that data and generation of new information, stemmed from a general premise which allowed specific conclusions to be drawn, and which could then be generalised to the population (Fain 2013:91; Gerrish & Lathlean 2015:162). It is envisaged that the adopted quantitative approach allows that findings arising from the study could be generalised to health care workers (HCWs) in the public healthcare sector, who face challenges of occupational health hazards in public health facilities in South Africa.

4.2.2 Research design

Grove et al (2015:211) define a study design as a blueprint for conducting a study, whereby broad assumptions are scaled down to detailed methodology in order to have maximum control over variables that may interfere with the desired findings of the study. For this study a descriptive cross-sectional survey design was used. The descriptive design was employed to investigate the challenges and impact of occupational hazards faced by HCWs in selected public hospitals, by using closed and open responses to collect data regarding current occupational health and safety practices in the Tshwane healthcare district, and provide objective descriptions of reality. The cross-sectional design was utilised based on the fact that data collection was done at one point in time, without having to follow-up subjects at a later stage (Grove et al 2015:212). A survey design (Parahoo 2014:167) was used to reach a large number of subjects at a given time.

4.3 RESEARCH METHOD

4.3.1 The research setting

The research setting for this study was the Tshwane healthcare district, which is located in Gauteng province in South Africa. Gauteng province is the hub of economic activities and opportunities, and was purposively selected among the nine provinces of South Africa. Based on considerations of costs, the Tshwane health care district was chosen to be the area of focus, with its seven health care sub-districts (Health-e 2013:6).

Tshwane district consists of seven healthcare sub-districts within which the health facilities are spread. The study was conducted in eight (8) public hospitals, namely, Steve Biko Academic, Dr George Mukhari Academic, Kalafong, Pretoria West, Tshwane district, Jubilee, Mamelodi and Odi hospitals. The eight hospitals constitute the three-tier levels of the South African health care delivery system, i.e. district, regional and central hospitals, using a feeder system from the lower level hospital to a higher level.

Five of the hospitals are at district level, each with a bed occupancy of: Pretoria West (178), Tshwane district (200), Jubilee (551), Mamelodi (400) and Odi hospitals (227). District hospitals render basic medical and surgical procedures, in-patient, emergency and ambulatory services. They provide a 24-hour service with the services of general

practitioners and clinical nurse practitioners are supported by regional hospitals as cited in the Regulations Relating to Categories of Hospitals, 2012 (R185) in terms on the National Health Act (NHA), 2003 (Act No. 61 of 2003), (Regulation R185, 2012, 2(a)(c)(d)) and the Department of Health (2012:35).

Kalafong hospital is at a regional level with a bed occupancy of 1113 and regional level hospitals render trauma and emergency services, including critical care. Basic health services provided also include internal medicine, general surgery, paediatrics, gynaecology and obstetrics (Regulation R185, 2012, Paragraph 4(1)(a)(c); Department of Health 2012b:36).

Dr George Mukhari and Steve Biko Academic hospitals are both central hospitals offering highly specialised medical and surgical services with bed occupancies of 1652 and 832 respectively (Health-e 2013:5; DENOSA 2010:1; Department of Health 2012b:36). They provide tertiary hospital services and central referral services. Furthermore, they are attached to medical schools and train providers of health care, as cited in the Regulation R185, 2012, 6(1)(a)(b)).

Table 4.1 Summary of participating hospitals and their bed occupancy

Hospital name	Type of hospital	Bed occupancy
Pretoria West hospital	District	178
Tshwane District hospital		200
Odi		227
Mamelodi		400
Jubilee		551
Kalafong	Regional	1113
Dr George Mukhari Academic	Academic	1652
Steve Biko Academic		832

4.3.2 Study population

A target population is the total population having characteristics of interest to the researcher, and it is the population to which the results of the research will be generalised

(Gerrish & Lathlean 2015:173). A study population is derived from a target population and it is a population that is accessible, and from which a sample is derived (Gerrish & Lathlean 2015:174; Grove et al 2015:250). In this study the population of 3-tier hospitals was comprised of eight (8) public hospitals in the seven sub-districts of the Tshwane healthcare district, in the Gauteng province. Furthermore, two thousand (2000) HCWs from the selected public hospitals, made up the study population, and whose occupational health and safety challenges were the focus of the investigation for the study.

4.3.3 Sampling

A sample is a process whereby individuals, behaviours or objects are selected to be subjects in a study (Grove et al 2015:351). In the current study, a two-staged sampling was used, whereby the public hospitals located in the Tshwane healthcare district were selected to participate in the study, by means of purposive sampling followed by census sampling of participants in the targeted hospitals, as described hereunder:

4.3.3.1 Sampling of research sites

A total of eight (8) 3-tier public hospitals were listed in the Tshwane healthcare district as falling under the levels of district, regional, central hospitals. Two (2) hospitals were specialised psychiatric hospitals, one (1) was a specialised TB hospital, and eight hospitals (8) were traditional 3-tier level hospitals at the levels of district, regional, tertiary/central hospitals. A purposive sample of 3-tier hospitals falling within the district, regional and central hospitals was selected. In order to avoid any selection bias and ensure representation, all district, regional and central hospitals in the Tshwane healthcare district were invited to participate in the study, and a total of eight (8) three-tier hospitals participated in the study.

(i) Inclusion criteria for hospitals

Hospitals selected in the study were public entities falling under district, regional and central hospitals in the Tshwane healthcare district in Gauteng province, as per inclusion criteria cited in LoBiondo-Wood and Haber (2014:233). Selected public hospitals were selected based on their high bed occupancy and various health services provided, which

range from a continuum of basic medical and surgical procedures to highly complex procedures and high technological advancement.

(ii) *Exclusion criteria for hospitals*

Excluded from the study were public health facilities (e.g. clinics) which were not classified as hospitals, and specialised public hospitals (e.g. TB & psychiatric hospitals) in Tshwane healthcare district. Also excluded were private hospitals in Tshwane healthcare district, and all other hospitals outside Tshwane.

4.3.3.2 *Sampling of participants in selected research sites*

The study, first made use of purposive sampling (Grove et al 2015:270) to select specifically nurse participants among all HCWs to take part in the study conducted in the Tshwane healthcare district, in Dr George Mukhari Academic, Steve Biko Academic, Kalafong, Odi, Tshwane, Jubilee, Mamelodi and Pretoria West hospitals. According to Gerrish and Lathlean (2015:181) purposive sampling is a non-probability sampling technique where decisions pertaining to participants who should take part in the study are left to the researcher's judgement. For the purpose of this study the HCWs that were targeted belonged to the nursing profession, and were purposively sampled from the entire population of HCWs as a source of data (Schutt 2012:157; Gerrish & Lathlean 2015:181), and as a group that were able to comprehend the issues under study, and who would therefore furnish pertinent information required. The researcher requested for a database of all nurses employed in the targeted hospitals and then used random sampling to identify a sample from the database received.

Secondly, the study made use of census sampling of nurses who were on duty on the particular days of data collection in eight hospitals. A total of 2000 nurses were on duty on the days reserved for data collection in the targeted hospitals, and were all invited to participate in the study, and of these, 926 volunteered to participate in the study. Table 4.2 shows the distribution of 926 nurses per category in targeted hospitals who took part in the study.

4.3.4 Data collection

4.3.4.1 Data collection methods and tools

Data was collected using various approaches, to include (i) a self-administered questionnaire for nurses and (ii) one structured checklist (Part A) for review of occupational health and safety (OHS) hospital records for occurrence of injuries and diseases, and another checklist (Part B) for review of occupational health and safety (OHS) policies for existence, implementation and compliance.

4.3.4.1.1 The self-administered questionnaire

A questionnaire used to collect data from participants comprised of structured closed-ended and open-ended questions. The close-ended questions required a 'yes' or 'no' response and further clarity was sought using the open-ended questions. The questionnaire was subdivided into the following subsections:

Section 1 consisted of demographic data with eight items which included participants' age group; marital status; race; nursing category; type of hospital; type of unit; years of experience in the unit; and years of experience in the health sector.

Section 2 was based on exposure to workplace hazards, and consisted of two subsections namely: biological and psychosocial hazards as described hereunder:

The sub-section on biological hazards was made up of eight items, which needed a 'yes; or 'no' response. Five items out of the eight items had open-ended questions from which participants were required to furnish more information to support their choices. The items solicited answers regarding needle stick injuries; splashes from patients' blood or body fluids; constant exposure to hazardous biological agents (HBA); medical waste disposal methods; exposure to hazardous drugs; and unwanted reactions from the use of latex gloves in the previous twelve months of their employment.

Psychosocial items in this sub-section were six in number and required 'yes' or 'no; responses, with four of the items having open-ended questions. The four items which required open answers covered aspects such as description of items that caused stress;

hours worked per week; shift-work related stress; whether the structure of the shift work suited their psychosocial well-being. One item required information regarding experiences of workplace violence in terms of who the perpetrator was and the nature of the violence. One item included options from which participants were required to choose what stressed them the most.

In section 3 the items covered aspects of work-related injuries and diseases. There were four items which also needed a 'yes' or 'no' response, and all of which had open-ended questions. In this section, participants were required to indicate if they did experience a work-related injury or contract an occupational disease in the previous twelve months of their employment. The nature of the injury or disease and the intervention by the employer had to be specified by the participants, and furthermore, they were requested to indicate if the injury was a musculoskeletal or other type of injury. One item required information on whether participants were on chronic medication and for which injury or disease was the medication.

Medical surveillance items were in section 4 and consisted of three items which needed 'yes' or 'no' responses and all items had open-ended questions as well. Items in this section solicited information regarding medical screening of participants upon appointment; periodic medical assessments; and medical screening upon rotation from one unit to the other. Further explanations were required in terms of diseases that participants screened for upon employment, and during rotation from one unit to the other; and at what intervals were the assessments.

Section 5 consisted of five items on workplace safety, which required a 'yes' or 'no' response, and two of the items had open-ended questions. Three closed-ended items assessed as to whether participants were trained on workplace hazards, and whether they were provided with personal protective equipment (PPE) and whether they were trained on the use of PPE. One open-ended item required information as to whether periodic safety inspections were conducted, by whom were they done and whether feedback was given regarding the outcome of the inspections, whereas one open-ended item asked about management commitment towards enhancing workplace safety and participants required to elaborate more on their answers.

Section 6 items were based on worker perspectives on health and safety promotion, and had two items which required only open responses. One item asked about participants' opinions on the health and safety of HCWs in the industry, whilst one item required them to furnish suggestions as to how the health and safety needs of HCWs in public hospitals can be addressed to enhance their quality of work life.

4.3.4.1.2 Part A: Checklist for inspection of OHS policy compliance

The checklist was used to collect data which assessed hospital demographics and occupational health and safety (OHS) policy compliance, based on the OHS Act, 1993 (Act. 85 of 1993) as amended. The checklist had closed and open-ended questions to elicit clarity of responses, and was completed by the researcher with the assistance of the occupational health nurse. The checklist consisted of the following sections:

Section 1 was comprised of demographic data which was comprised of three items namely: the sub-district in which the hospital was located; type of hospital whether district, regional or central hospital and person in charge of OHS service either occupational health nurse, professional nurse, nurse manager or any relevant person.

Section 2 consisted of items on policy existence, compliance and implementation, and was comprised of eleven items that required 'yes' or 'no' responses to assess as to whether OHS policy existed in the workplaces, and whether it was complied with by management and whether it was accordingly implemented. Two of the items further requested more clarity on how long ago were risk assessments and inspections conducted in the workplace.

Section 3 contained seven training and information dissemination items with 'yes' or 'no' questions to assess if training was conducted to educate workers about OHS issues and whether OHS information regarding injuries and diseases was disseminated to workers.

Medical Surveillance items were in section 4 and had seven items as well, all requiring 'yes' or 'no' responses. The items solicited information about which infectious diseases were participants periodically screened for, and whether there was provision made for re-assigning pregnant workers to other duties.

Section 5 consisted of three health and safety initiatives items which needed only open responses. Participants had to furnish information on factors affecting safety promotion in their hospitals; hospital interventions for pregnant workers; and what health and safety promotion programmes would they recommend for their hospitals.

4.3.4.1.3 Part B: Checklist for review of records on occupational diseases and injuries

The second checklist was designed for use by the researcher to check for occurrence of occupational diseases and injuries, in order to establish and describe an existing trend or pattern among HCWs in the Tshwane healthcare district public hospitals in the past three-year period. The questions required the following responses: 'yes', 'no', 'figure' and/or 'comment' pertaining to occurrence of common infectious diseases among HCWs, and records were checked for this purpose. The checklist was divided into two sections as follows:

Section 1 items were based on occurrence of occupational diseases, and the section was made up of five sub-section with fourteen items. Four sub-sections each assessed a particular type of occupational infectious disease among HCWs in the previous three-year period of their employment. The diseases were assessed in terms of the number of workers who contracted the disease; the source of infection; and whether there was any medical boarding or death following ill-health. One sub-section assessed as to whether other diseases were reported despite the ones investigated in the four sub-sections in this category.

Section 2 consisted of items on occurrence of occupational injuries, which investigated occupational musculoskeletal disorders in terms of number of nurses who sustained injuries; what the cause of the injury was; whether there was any medical boarding; and whether there were any compensations from COIDA, in the previous three-year period.

4.3.4.2 Data collection process

Firstly, permission was sought and granted by relevant authorities: the University of South Africa Health Studies Higher Degrees Committee; the Department of Health Gauteng

Province Research and Ethics Committee; and the Tshwane Healthcare District office. Data was collected following the steps described hereunder:

4.3.4.2.1 Steps in the data collection process

The research process was conducted in three steps as described hereunder:

(i) Step one

The first phase included conducting a survey by means of a self-administered questionnaire which were handed to 2000 nurses working in all central (central, academic and tertiary grouped as one), regional and district public hospitals in the Tshwane healthcare district, Gauteng province. The researcher and research assistants visited each hospital on a specific date assigned. Each hospital was allocated three days for research. Day one was the distribution of self-administered questionnaires to eligible participants in the selected public hospitals per time. The purpose of the research was explained and willing participants were requested to sign a consent form. All eligible participants were requested to fill in the questionnaire after a short briefing. Night nurses were briefed by the night supervisor. Each ward and clinic within each hospital was provided with questionnaires. The researcher used sealable envelopes for collecting the filled-in questionnaires which were locked up by the unit manager until collection the following day.

(ii) Step two

The second day was reserved for collection of filled-in questionnaires in order to avoid nurses who were off duty or on leave on the data collection day, to access and fill in questionnaires. The researcher and two assistants collected the questionnaires on the second day. Nurse managers in respective hospitals were requested to prepare for review of OHS documents on the third day.

(iii) Step three

Phase three was implemented on the third day of research per hospital per time. The researcher worked with the occupational health nurse (OHN) in each hospital. A self-

administered structured checklist (Part A) was provided to the OHN to assess the existence, compliance and implementation of occupational health policies per hospital. Evidence of records was shown to the researcher to verify the responses provided by the OHN in the checklist.

To gather information from supporting occupational health and safety (OHS) records and documents, a second checklist (Part B) was used. The OHS records were reviewed the researcher in retrospect, with the assistance of the OHN to assess the nature and occurrence of occupational diseases and injuries experienced by nurses in the previous three-year period, i.e. from 2011-2014. The data collection steps were carried out for all selected hospitals.

4.3.4.3 Ethical considerations related to data collection

4.3.4.3.1 Permission

Permission to conduct research was granted by the University of South Africa Health Studies Higher Degrees Committee; the Department of Health Gauteng Province: Research and Ethics Committee; and the Tshwane Healthcare District office. The researcher requested permission to access the premises of the facilities for data collection from the Heads of the respective research sites.

4.3.4.3.2 Informed consent

Getting informed consent involved providing the participants with information regarding the positive and negative effects and impact of the intended research (Beck 2013:362). An informed consent letter was attached to the questionnaire. Prior to commencement, a briefing was given to the participants about the aim and purpose of the research, and those who volunteered to participate were asked to sign the consent form.

4.3.4.3.3 Confidentiality and anonymity

Participants were assured about the confidentiality of their responses. The responses were put in sealable envelopes which were distributed in the units, kept safe and private (Beck 2013:362) by the unit manager until collected the following day by the researcher

and research assistants. Responses were kept safe until they were handed in to the statistician. There was no disclosure of the participants' identities and the collected data was kept secured (Munhall 2012:306). Furthermore, the possibility of linking the responses to the participants was not created, as participants' personal data were not required (Grove et al 2015:107).

4.3.5 Data analysis

Data collected was condensed and arranged accordingly, based on the quantitative requirements and open-ended responses were text analysed. Grove et al (2015:502) described quantitative data analysis as a technique used to condense, systematise and give meaning to data. All data derived from close-ended questions was analysed using the statistical computations. The study data were captured on an Excel spread sheet. Data capturing was verified and validity checks were performed. According to the statistician's report, databases were cleaned before the statistical analysis. Data analysis was performed on SAS (SAS Institute Inc, Carey, NC, USA), Release 9.3, running under Microsoft Windows for a personal computer. The procedure PROC FREQ was used for analyses of percentages and PROC MEANS was used for basic descriptive statistics (means, standard deviations, minimum and maximum values. All statistical tests were two-sided and values ≤ 0.05 were considered significant using the Fischer-Exact test and the Chi-square.

Open-ended responses were analysed for text. The approach is relevant where subjective personal meaning is required to understand the meaning attached to participants' personal experiences (Ellis 2013:59). Inductive reasoning was applied to the open responses to move from specific individual responses to general statements (Ellis 2013:59). To ensure validity and trustworthiness of the results, findings from participants were compared with data obtained from review of OHS records. Data from participants' open-ended responses was analysed using categories, through quantified and coded written descriptions from participants (Parahoo 2014:370) which were formed into narratives. Analysis culminated into formation of thematic explanations as identified from the open responses of participants, which assist in providing interpretations and helps the researcher to associate narratives with the content of the research (Alhojailan 2012:40). Themes are said to be topics and final outputs arising from the analysed data (Munhall

2012:319; Gale, Heath, Cameron, Rashid & Redwood 2013: [2]), in this case, analysis of open-ended responses.

4.4 INTERNAL AND EXTERNAL VALIDITY OF THE STUDY

4.4.1 Validity

4.4.1.1 Face validity

The measure to which the study is accurate or truthful is referred to as validity in Grove et al (2013:197). The data collection instruments gave an appearance of measuring the concepts under study, as correct and suitable concepts and words were used for clarity and avoidance of uncertainties, as explained in LoBiondo-Wood and Haber (2014:293). The researcher enhanced face validity by ensuring that the data collection tools were readable and understandable to the user. The researcher ensured that the data tools and the study objectives were aligned. The tools were presented to the supervisor who has expertise in occupational health and safety, and the statistician for re-checking before being distributed to participants.

4.4.1.2 Content validity

Content validity is defined in LoBiondo-Wood and Haber (2014:292) as the representation of the content domain. In this current study the measure of accuracy was maintained by ensuring that items in the survey tools were structured to represent the content domain, and that they remained the same for all subjects. Literature was reviewed in line with the content domain prior construction of the tool. The researcher developed items based on review of data tools used in occupational health and safety studies for relevance and accuracy, and in order to reflect representation of the content domain (LoBiondo-Wood & Haber 2014:292). Furthermore, the items within the tool were structured to measure the construct as intended and this was ensured by running the tool through an expert in the field of study and the statistical expert to scrutinise and correct, and to further ensure statistical validity on item measurement. The researcher pre-tested the tools using colleagues and other nurses who were not eligible to take part in the research. Findings of the pilot survey were not included in the main study, but data was used to refine the questionnaire where necessary.

4.4.1.3 Design validity

Parahoo (2014:203) states that external validity is ensured when the results of the research can be generalised to the larger population. Interaction to selection as cited in Grove et al (2013:202) is a threat to external validity, and can hamper general application of research results to the larger population, moreover if a large number of subjects declined to participate and the size of the sample is very limited in numbers. In this study a census sample used, and it was assumed to have ample characteristics of the population, as it contained a large number of subjects of the study population to validate the research.

4.4.2 Reliability

Fain (2013:148) describes reliability as the consistency with which an instrument should yield the same results if used repeatedly on the same participant, with no occurrence of random error (Grove et al 2013:389). In this study, reliability was achieved as there was consistency in the responses from the subjects. The data collection tools used for this study were the same, and the items within the tools remained the same for all subjects at all times, and yielded the same results when re-administered to different people.

4.5 CONCLUSION

The chapter gave a description of the steps and methods and procedures used in conducting the research. Methodology was explained in terms of the population under study and how the sample was acquired through sampling procedure. Data collection was discussed under data collection method, the data instruments used and the characteristics of the data tools, and the process undertaken to collect data. A data analysis brief was provided and the ethical considerations undertaken for the study. Validity and reliability measures within the study were highlighted as well.

In the following chapter data has been presented, interpreted and discussed.

CHAPTER 5

ANALYSIS, PRESENTATION AND DISCUSSION OF THE RESEARCH FINDINGS

5.1 INTRODUCTION

This chapter presents an analysis of the study's data in tables and graphs. The chapter also outlines the analysis of open-ended responses undertaken through quantifying and coding the data, to provide a thematic narrative explanation with regard to this data. The presentation that follows is a three-part layout of research findings that focuses on the three data tools used for data collection, where data tool one and two are presented in terms of statistical findings and thematic narrative, and tool three is presented using statistical findings.

5.2 RESEARCH RESULTS LAYOUT

The results are presented in four sections in accordance with the three data tools used for data collection in this study. The first section presents the results from the data gathered from participants' questionnaires, and this is presented in statistical and thematic narrative form. The narrative stemmed from open-ended responses.

The second section comprises of data presentation from a checklist used to inspect on OHS policy compliance (part A) over a three-year period (2011-2014). The inspection revealed that not all eight hospitals that participated in the study were compliant with OHS policy.

The third section presents data from the checklist related to the review of records on the occurrence of occupational diseases and injuries (part B) over a three-year period ranging from 2011-2014. This review indicated that needle stick injuries were the highest among nurses.

The last section discusses the research results. These results are presented hereunder.

5.3 RESULTS ON DATA FROM QUESTIONNAIRES

The analysis of data collected by means of questionnaires show that a total of 2 000 HCWs across the 8 public hospitals located in the Tshwane District were recruited to participate in the study. A total of 926 participated in the study and this gives a 46.30% response rate. The attrition rate of 53.70% was as a result of HCWs who cited high workload as a reason for not participating.

5.3.1 Participants' demographic data

As shown in table 5.1, all participants were females and belonged to the nursing profession. The demographic results are such that the age distribution reveals that 235 (25.4%) of the participants were in the 40-49 years age range, followed by 220 (23.8%) in the 20-29 years group. The participants' marital statuses consisted of 400 (43.2%) who were single, 293 (31.6%) married and 82 (8.9%) were divorced. In addition, the participants' racial distribution reveals the 821 (88.6%) were Black compared to 45 (4.9%) Whites. Finally, the statistics of Coloureds and Indians were 21 (2.7%) and 7 (0.8%), respectively. The analysis shows that 300 (32.4%) participants were professional nurses, followed by 183 (19.8%) auxiliary nurses and 170 (18.3%) enrolled nurses.

The participant distribution according to the type of hospitals studied is that 286 (30.9%) were from district hospitals, 269 (29.0%) from central hospitals and 187 (20.2%) regional hospitals. An Analysis of the participants' unit distribution revealed that 174 (18.8%) were in surgical wards, with 157 (17.0%) in other units and 142 (15.3%) in medical wards. Finally, the participants' work experience in current units, shows that 375 (40.5%) 1-3 years followed by 206 (22.3%) who had over 10 years work experience. Furthermore, a total of (52.2%) HCWs had 0-9 years' experience in the health industry, followed by 176 (19.0%) with 20-29 years of experience, and 160 (17.3%) with 10-19 years.



Table 5.1 Summary of participants' demographic data (n=926)

Variable	n	%
Participants' gender		
Female	926	100.0
Male	0	0.0
Participants' age group		
Below 20	1	0.1
20-29	220	23.8
30-39	219	23.7
40-49	235	25.4
50-59	195	21.0
60+	28	3.0
Missing	28	3.0
Total	926	100.0
Marital status		
Divorced	82	8.9
Engaged	29	3.1
Living together	71	7.7
Married	293	31.6
Single	400	43.2
Widowed	29	3.1
Missing	22	2.4
Total	926	100.0
Race		
Black	821	88.6
Coloured	25	2.7
Indian	7	0.8
White	45	4.9
Other	5	0.5
Missing	23	2.5
Total	926	100.0
Professional category		
Nurses	926	100.0
Nursing category		
Auxiliary nurses	183	19.8
Enrolled nurses	170	18.3
Nurse managers	105	11.3
Professional nurses	300	32.4
Student nurses	146	15.8
Missing	22	2.4
Total	926	100.0
Type of hospital		
Central	269	29.0
District	286	30.9
Regional	187	20.2
Missing	184	19.9
Total	926	100.0

Variable	n	%
Type of unit		
Out-Patients Department	92	9.9
Casualty	87	9.4
Maternity	70	7.6
Medical wards	142	15.3
Paediatric wards	94	10.1
Surgical wards	174	18.8
Theatre	59	6.4
Wellness	16	1.7
Other (Intensive care unit, renal unit, burns unit)	157	17.0
Missing	35	3.8
Total	926	100.0
Years of experience in current unit		
1-3	375	40.5
4-6	124	13.4
7-9	94	10.1
10+	206	22.3
Missing	127	13.7
Total	926	100.0
Years of experience in health care industry		
0-9	484	52.2
10-19	160	17.3
20-29	176	19.0
30-39	72	7.8
40+	9	1.0
Missing	25	2.7
Total	926	100.0

5.3.2 Biological hazards

This section focuses on 8 questions which required a 'yes' or no response from the participants. Some of the responses, however, required participants to elaborate on the choice of responses they would have made.

The analysis shows that 76 (8.2%) of the participants reported that they had experienced needle prick injuries (NSI) in the last 12 months compared to 833 (89.9) who reported the opposite as shown in table 5.2. Furthermore, 366 (39.5%) of the participants experienced negligent disposal of used injection needles, whilst 537 (58.0%) had no experience of negligent disposal of used needles. Only 85 (9.2%) participants experienced exposures to splashes from patients' infected blood or other body fluids in the twelve-months previous to the study as shown in table 5.2.

The analysis further shows that 611 (66.0%) of the participants reported to be constantly exposed to hazardous biological agents (HBAs) at work. This finding is supported by statements from participants which read: “...splashed by gastric contents of a patient infected with HIV...” and: “...accidental self-prick after pricking a HIV+ patient when putting up a drip...”

A total of 578 and constitution (62.4%) of the participants were in constant exposure to medical waste as shown in Table 5.2. A further 747 (80.6%) participants experienced effective methods of medical waste disposal in their hospitals, while 133 (14.4%) indicated that medical waste disposal methods were not effective in their hospitals. Twenty-six (2.8%) participants reported that they had accidental exposure to hazardous drugs in the past twelve months, while 75 (8.1%) experienced unwanted reactions from the use of latex gloves in the twelve months previous to the study as shown in table 5.2.

Table 5.2 Summary of participants’ responses on biological hazards (n=926)

Variable	n	%
Have you experienced a needle stick injury at work in the past twelve months?		
Yes	76	8.2
No	833	90.0
Missing	17	1.8
Total	926	100.0
Have you experienced negligent disposal of used needles?		
Yes	366	39.5
No	537	58.0
Missing	23	2.5
Total	926	100.0
Have you experienced splashes from patients’ infected blood or other body fluids in the past twelve months?		
Yes	85	9.2
No	806	87.0
Missing	35	3.8
Total	926	100.0
Are you in constant exposure to biological agents in your unit?		
Yes	611	66.0
No	264	28.5
Missing	51	5.5
Total	926	100.0

Variable	n	%
Are you in constant contact with medical waste?		
Yes	578	62.4
No	272	29.4
Missing	76	8.2
Total	926	100.0
Are medical waste disposal methods used in your organisation effective?		
Yes	747	80.7
No	133	14.3
Missing	46	5.0
Total	926	100.0
Have you had accidental exposure to hazardous drugs in the past twelve months?		
Yes	26	2.8
No	879	94.9
Missing	21	2.3
Total	926	100.0
Did you at any time experience unwanted reactions from the use of latex gloves in the past twelve months?		
Yes	75	8.1
No	825	89.1
Missing	26	2.8
Total	926	100.0

5.3.2.1 Factors leading to needle stick injuries as reported by participants

Data analysis indicated that of the 76 (8.21%) nurses who experienced needle stick injuries (NSI), 16 (21.05%) reported that they had an accidental self-prick related to incorrect sharps disposal procedure, with 15 (19.74%) having reported accidental self-pricks while administering injections to aggressive and or uncooperative patients. Further self-pricks sustained while pricking patients' fingers in order to do rapid tests were reported in 10 (13.16%) participants, with some of the patients being known to be infected with the human immunodeficiency virus (HIV). In other instances of self-pricks, 3 (3.95%) participants were attending to a patient's intravenous infusion, 2 (2.63%) mishandled a needle, 2 (2.63%) were performing invasive procedures on a patient, whilst 1 (1.32%) experienced self-pricks in an emergency situation. Accidental pricks by other HCWs accounted for 4 (5.26%) of NSI among nurses, and 23 (30.26%) were unknown factors, as shown in figure 5.1.

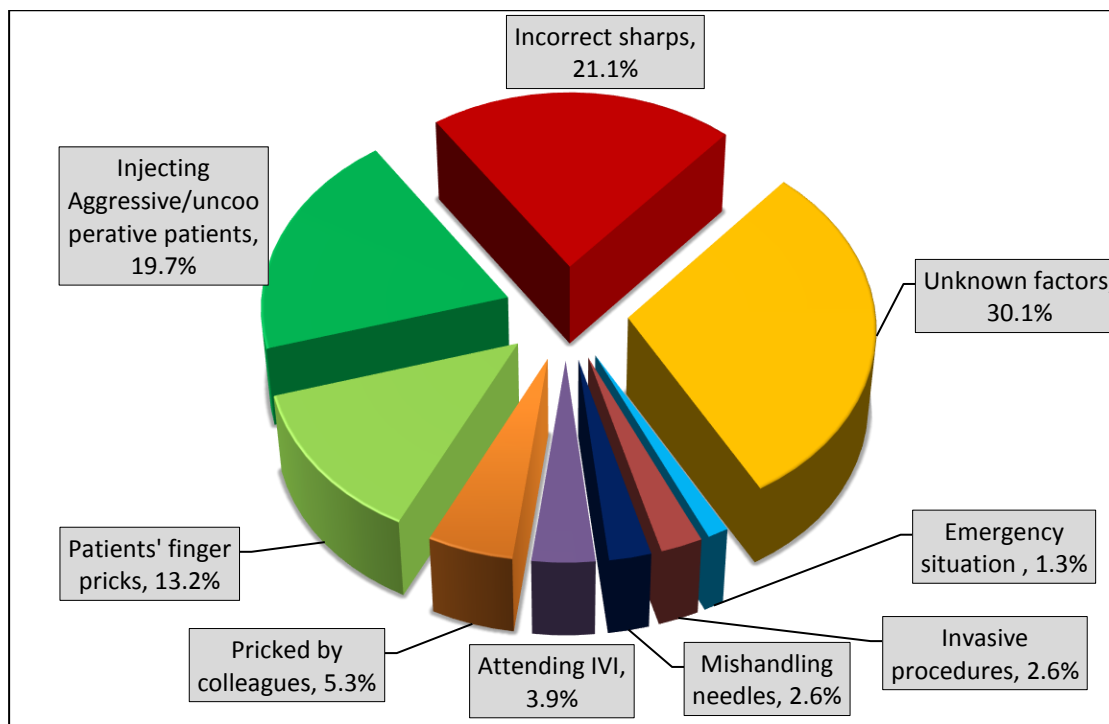


Figure 5.1 Factors leading to needle stick injuries as reported by participants (n=76)

5.3.2.2 Factors attributed to negligent disposal of used needles

The responses related to the multiple of reasons for negligent disposal of used needles show that of the 366 (39.5%) participants who experienced negligent disposal of used needles, 36 (9.8%) were due to lack of appropriate disposal containers in their work areas, whilst 43 (11.7%) indicated insufficient disposal bins as a reason for negligent disposal of used needles as depicted in table 5.3. in addition, 94 (25.7%) participants attributed their experiences of negligent disposal of used needles to lack of staff training regarding proper needle disposal. Another 193 (52.7%) participants cited staff attitudes as responsible for the negligent disposal of used needles. The analysis shows that a further 51 (13.9%) participants attributed negligent disposal of used needles to unknown factors.

Table 5.3 Factors attributed to the negligent disposal of used needles (n=366)

Variable	n	%
Lack of disposal bins		
Yes	36	9.8
No	53	14.5
Missing	277	75.7
Total	366	100.0
Insufficient disposal bins		
Yes	43	11.7
No	54	14.8
Missing	269	73.5
Total	366	100.0
Lack of staff training on proper needle disposal		
Yes	94	25.7
No	43	11.7
Missing	229	62.6
Total	366	100.0
Staff attitudes regarding needle disposal		
Yes	193	52.7
No	28	7.7
Missing	145	39.6
Total	366	100.0

5.3.2.3 Participants' responses regarding factors that led to splashes from patients' infected blood or other body fluids (n=85)

Participants who reported exposures to patients' infected blood or other body fluids through splashes were requested to furnish an explanation pertaining to how the incident occurred, and their responses were grouped, categorised and presented in figure 5.2. A total of 27 (31.8%) experienced splashes from patients' infected blood or other body fluids while engaging with invasive procedures such as suctioning, intubation, slough removal, delivery of a baby and the insertion of a drain on the patients. Furthermore, 1 (1.2%) of the participants experienced splashes due to lack of personal protective equipment (PPE), as captured in figure 5.2.

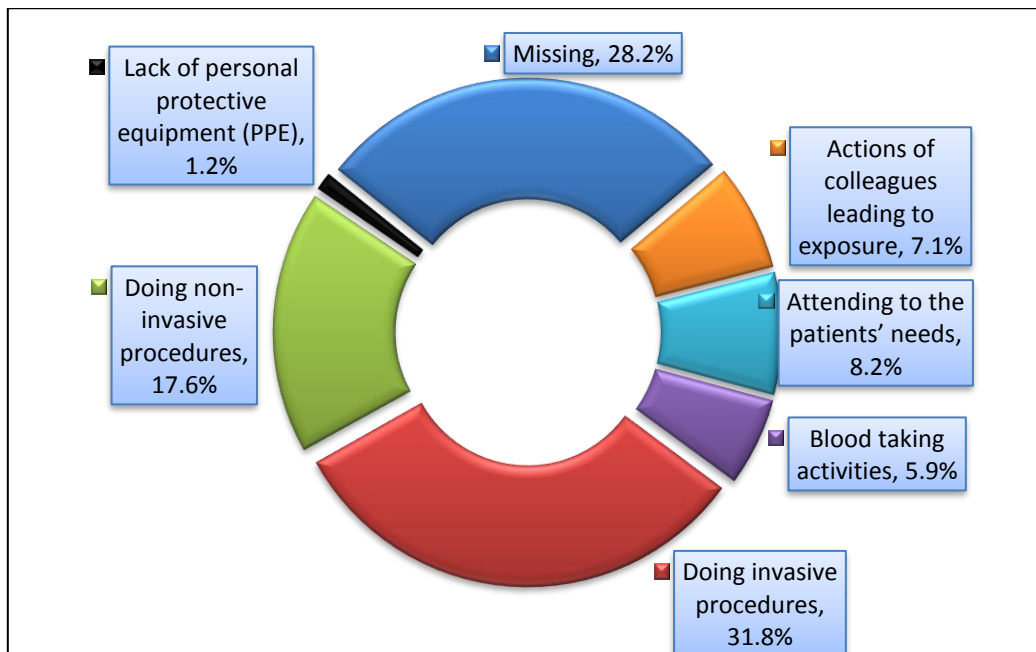


Figure 5.2 Participants' responses regarding factors that led to splashes from patients' infected blood or other body fluids (n=85)

5.3.2.4 Responses of participants regarding improvement of medical waste disposal methods

An analysis of data indicates that further explanations were provided by those participants who experienced ineffective medical waste disposal methods, as to how the waste disposal methods could be improved, as indicated in table 5.4. In-service training to staff was cited by 54 (40.6%) participants as a possible method to improve waste disposal, followed by adherence to waste removal standards and procedures that were suggested by 23 (17.3%) participants. The least suggested was patient education by 2 (1.5%) participants.

Table 5.4 Responses of participants regarding improvement of medical waste disposal methods (n=133)

Variable	n	%
Provision of waste disposal resources	19	14.3
In-service to staff to medical doctors	54	40.6
Medical staff attitudes to be addressed	6	4.5
Patient education regarding waste disposal	2	1.5
Adherence to waste removal standards and procedures	23	17.3
Missing	29	21.8
Total	133	100.0

5.3.2.5 Participants’ responses on the effects of exposure to hazardous drugs on HCWs

The participants who reported exposure to hazardous drugs furnished further explanations about the effect that the drugs might have had on their health or body as a result of exposure. Three (11.5%) of the participants reported no effect on their health or body, whilst 2 (7.7%) were not sure, with 1 (3.9%) reporting that their eyes were affected and another 1 (3.9%) reporting the peeling of the skin. The results of these responses are presented in figure 5.3.

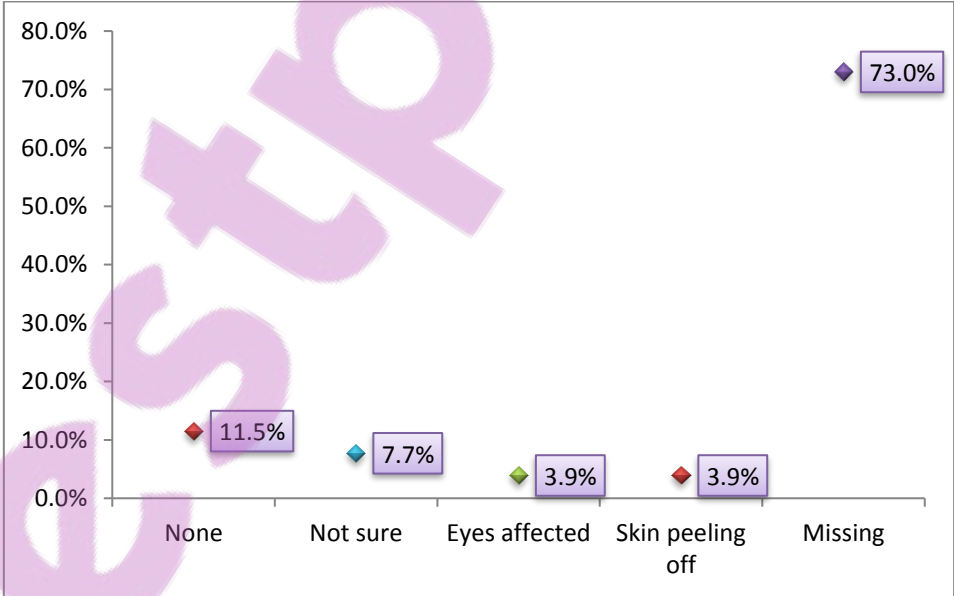


Figure 5.3 Participants’ responses on the effects of exposure to hazardous drugs on HCWs (n=26)

5.3.2.6 Responses regarding protection against contamination with infectious agents as provided by the hospital

Explanations were provided by 75 (8.1%) participants who experienced unwanted reactions, with 28 (37.3%) stating that they were provided with powder-free gloves by the hospital, whilst 7 (9.3%) indicated that no provision was made by the hospital to ensure protection against infectious agents, as shown in table 5.5.

Table 5.5 Responses regarding protection against contamination with infectious agents as provided by the participants (n=75)

Variable	n	%
No provision made by management	7	9.3
Allergy not reported	1	1.3
Bought own powder-free gloves	2	2.7
Poor quality gloves provided	1	1.3
Powder-free gloves provided	28	37.3
Insufficient supply of powder-free gloves	3	4.0
Biogel gloves provided	2	2.7
Referred for treatment	2	2.7
No intervention mentioned	2	2.7
Missing	27	36.0
Total	75	100.0

5.3.3 Psychosocial hazards

Participants were required to respond with either a 'yes' or 'no' in this section. They were also requested to furnish more information to further clarify a 'yes' response.

Data analysis presented in table 5.6 indicates that 625 (67.5%) participants experienced stress from collective factors such as long hours of work, shift work, increased workloads, insufficient rest periods, workplace violence and other unknown stressors, whilst 243 (26.2%) did not experience stress from any of the collective factors. A further analysis of data on individual stress factors indicates that stress related to long hours of work was experienced by 393 (42.0%) participants. Finally, 300 (32.4%) participants experienced stress related to shift work.

Table 5.6 shows that 522 (56.4%) participants felt that shift work was well structured to suit their psychosocial wellbeing, whereas 318 (34.3%) indicated to the contrary. The analysis reveals 241 (26.0%) participants as having experienced workplace violence in the past twelve months of their employment, whilst 636 (68.7%) did not experience violence in the same period. Increased workloads were reported as the worst stressor by 386 (41.7%) and workplace violence was identified by as 59 (6.4%) participants as the least reported stressor.

Table 5.6 Summary of participants' responses on psychosocial hazards (n=926)

Variable	n	%
Do you experience work-related stress in relation to e.g. long hours of work, shift work, increased workloads, insufficient rest periods, workplace violence or any other stressor?		
Yes	625	67.5
No	243	26.2
Missing	58	6.3
Total	926	100.0
Do you experience long hours of work?		
Yes	393	42.0
No	480	52.0
Missing	53	6.0
Total	926	100.0
Do you experience work-related stress in relation to shift work?		
Yes	300	32.4
No	567	61.2
Missing	59	6.4
Total	926	100.0
Do you feel shift work is well structured to suit your psychosocial well-being?		
Yes	522	56.4
No	318	34.3
Missing	86	9.3
Total	926	100.0
Did you experience workplace violence in the past twelve months?		
Yes	241	26.0
No	636	68.7
Missing	49	5.3
Total	926	100.0
Which of the following stresses you the most?		

Variable	n	%
Long hours of work	193	20.8
Missing	733	79.2
Total	926	100.0
Shift work	59	6.4
Missing	867	93.6
Total	926	100.0
Increased workloads	386	41.7
Missing	540	58.3
Total	926	100.0
Insufficient rest periods	197	21.3
Missing	729	78.7
Total	926	100.0
Workplace violence	59	6.4
Missing	867	93.6
Total	926	100.0

5.3.3.1 Participants' descriptions of stressors

The participants' item descriptions of the stressors are grouped, summarised and presented in figure 5.4. The highest stressor was indicated as increased workload by 207 (33.1%) of the participants, followed by staff factors which were stated by 128 (20.5%) participants.

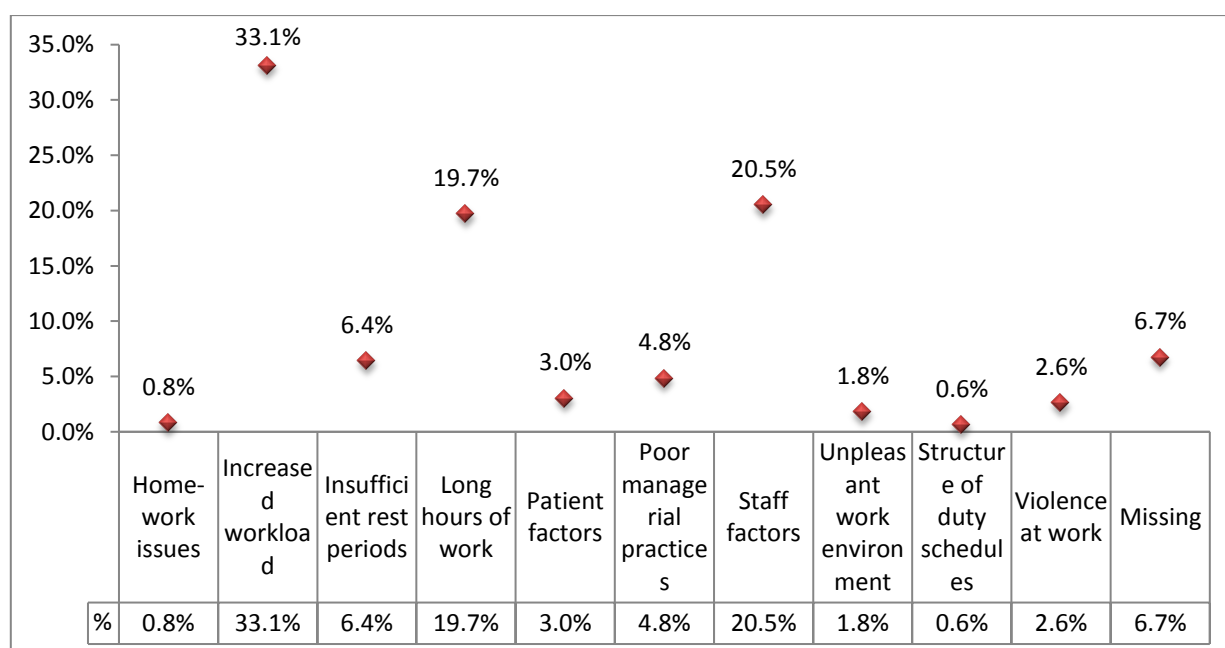


Figure 5.4 Participants' descriptions of stressors (n=625)

5.3.3.2 Participants' responses regarding hours worked per week

Table 5.7 shows the participants who reportedly experienced long hours of work and furnished more responses indicating the number of hours they worked in a week. A total of 151 (38.4%) worked 40 hours a week and these are followed by 89 (22.7%) who worked 41-50 hours in a week.

Table 5.7 Participants' responses regarding hours worked per week (n=926)

Variable	n	%
40 hours	151	38.4
Less than 40 hours	12	3.1
41-50 hours	89	22.7
More than 50 hours	13	3.3
Differs per week	44	11.2
Depends on absenteeism	9	2.3
Unspecified number of hours	54	13.7
Missing	21	5.3
Total	393	100.0

5.3.3.3 Participants' responses regarding factors contributing to stressful shift work

The participants provided explanations on how stressful shift work was. Multiple responses were provided for the item, thus resulting in an overall 100% responses. Long hours of work (27.3%) in a shift were indicated as the highest contributor to stressful shift work and this was followed by home-work interface factors which accounted for 23.7% of the responses. These data results are presented in figure 5.5.

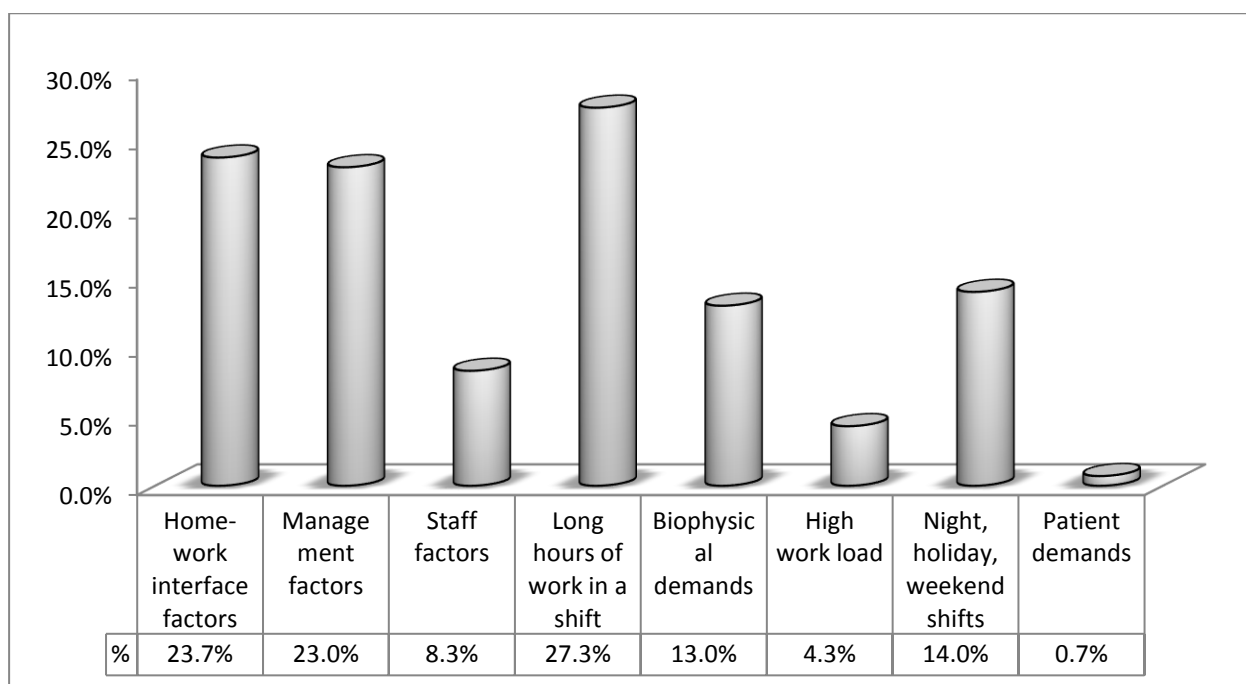


Figure 5.5 Participants' responses regarding factors contributing to stressful shift work (n=300)

5.3.3.4 Participants' responses regarding shift work that is not well structured to suit their psychological wellbeing

Participants who responded with a 'no' were required to furnish an explanation for their responses. As a result, 150 (47.2%) indicated social demands as the reason for unsuitable 'shift work structure' as presented in table 5.8.

Table 5.8 Participants' responses regarding shift work that is not well structured to suit their psychological wellbeing (n=318)

Variable	n	%
Social demands	150	47.2
Insufficient rest	46	14.4
Long hours	35	11.0
Structure of shifts	25	7.9
Management issues	30	9.4
Discard	7	2.2
Missing	25	7.9
Total	318	100.0

5.3.3.5 Participants' responses regarding the perpetrator of the violence

Participants who answered with a 'yes' had follow-up questions to respond to, namely: who was the perpetrator of the violence? What was the nature of the violence? Participants had a choice of more than one option.

5.3.3.5.1 Who was the perpetrator of the violence? (n=241)

Data, as captured in figure 5.6, reveals that the highest number of perpetrators of violence, 124 (51.4%), were the patients-to-staff violence, followed by patients' family members-to-staff at 97 (40.2%).

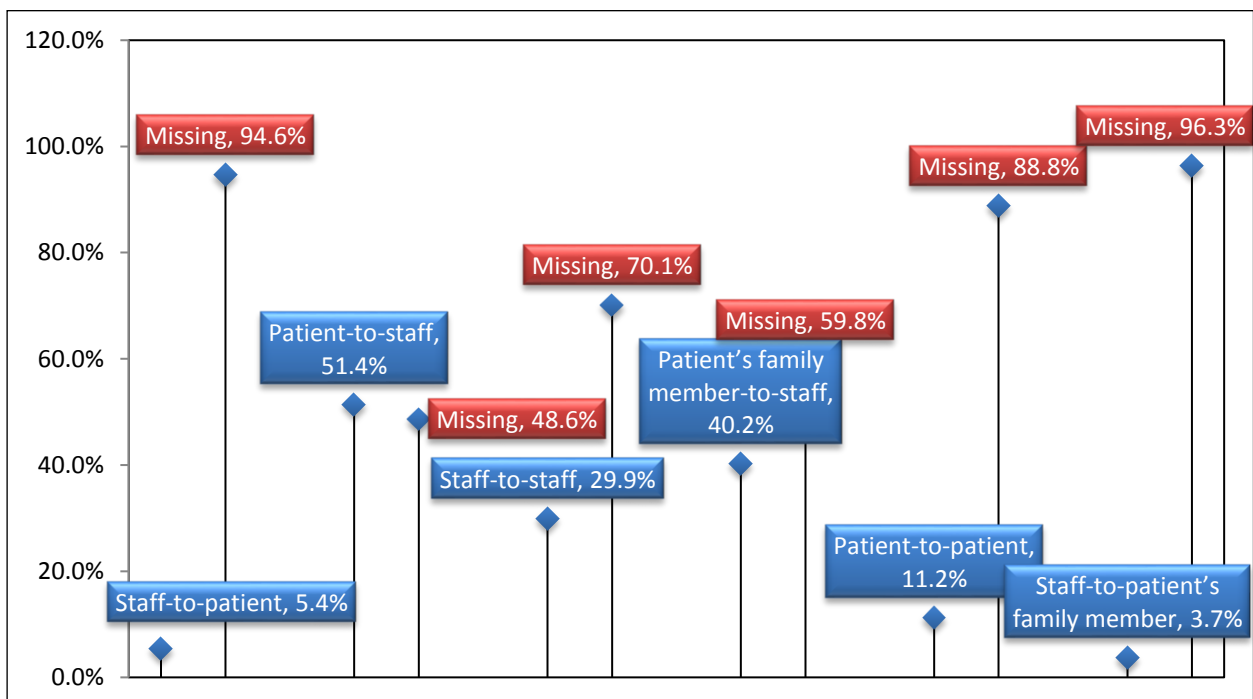


Figure 5.6 Participants' responses regarding the perpetrator of the violence (n=241)

5.3.3.5.2 What was the nature of the violence?

The responses on the nature of violence are captured in table 5.9. The most common form of violence experienced by HCWs was verbal attacks as stated by 211 (87.6%) followed by assault 37 (15.3%) and physical attack with a weapon 18 (7.5%).

Table 5.9 Participants' responses regarding the nature of the violence (n=241)

Nature of the violence	n	%
Physical attack with/without a weapon	18	7.5
Missing	223	92.5
Total	241	100.0
Assault	37	15.3
Missing	204	84.7
Total	241	100.0
Verbal attack	211	87.6
Missing	30	12.4
Total	241	100.0
Other	3	1.2
Missing	238	98.8
Total	241	100.0

5.3.4 Work-related injuries and diseases

Participants were required to respond with either a 'yes' or 'no' in this section and in cases of a 'yes' response, they were requested to furnish more information to clarify the answer.

Data analysis, as depicted in table 5.10, reveals that 38 (4.1%) participants sustained work-related injuries in the past twelve months of employment, and 847 (91.5%) did not sustain work-related injuries in the same period. In addition, 22 (2.4%) participants contracted an occupational disease and 139 (15.0%) participants sustained musculoskeletal injuries in the past twelve-month period. Fifty (5.4%) were on chronic medication.

Table 5.10 Summary of participants’ responses on work-related injuries and diseases (n=926)

Variable	n	%
Have you suffered any work-related injuries in the past 12 months in your current employment?		
Yes	38	4.1
No	847	91.5
Missing	41	4.4
Total	926	100.0
Have you contracted any occupational diseases in the past 12 months in the current employment?		
Yes	22	2.4
No	863	93.2
Missing	41	4.4
Total	926	100.0
Did you sustain any musculoskeletal injury at work in the past 12 months?		
Yes	139	15.0
No	746	80.6
Missing	41	4.4
Total	926	100.0
Are you on any chronic medication for a work-related injury or disease?		
Yes	50	5.4
No	838	90.5
Missing	38	4.1
Total	926	100.0

5.3.4.1 Participants’ responses to work-related injuries and employer intervention

A total of 38 (4.1%) participants who sustained work-related injuries described the type of injuries that they had sustained and the nature of the employer’s intervention. Eleven (29.0%) participants reported that they had suffered strained backs, with 8 (21.1%) stating that their employer referred them to casualty and another 8 (21.1%) having experienced no management intervention. Table 5.11 presents the above-discussed data results.

Table 5.11 Participants' responses to work-related injuries and employer intervention (n=38)

Variable	n	%
Type of injury sustained		
Cut tendon	1	2.6
Strained back	11	29.0
Finger injury	2	5.3
Head injury	1	2.6
Fractured thumb	2	5.3
Injured foot	1	2.6
Fractured tibia and fibula	1	2.6
Injured ankle	1	2.6
Injured both knees	1	2.6
Spinal injury	1	2.6
Needle prick injury	2	5.3
Face injury	1	2.6
Shoulder spasms	1	2.6
Fractured toe	1	2.6
Emotional and psychological strain	2	5.3
Missing	9	23.8
Total	38	100.0
Intervention by employer		
Referred to casualty	8	21.1
Moved from a strenuous to a less strenuous unit	1	2.6
Given time to rest at home	1	2.6
No intervention by employer	8	21.1
Missing	20	52.6
Total	38	100.0

5.3.4.2 Participants' responses to types of occupationally acquired diseases and intervention by employer

Further responses were elicited from those who responded with a 'yes' to indicate the type of disease contracted and the type of intervention that was made by the employer. Table 5.12 shows that tuberculosis 4 (18.0%) as the most contracted disease, with 3 (13.9%) of the participants stating that there was no employer intervention.

Table 5.12 Participants' responses to types of occupationally acquired diseases and intervention by employer (n=22)

Variable	n	%
Type of acquired occupational disease		
Tuberculosis	4	18.0
Chicken pox	1	4.6
Allergic reaction	1	4.6
Painful swollen legs	1	4.6
Sore throat due to pseudomonas	1	4.6
Influenza	1	4.6
Lung infection	2	9.0
Missing	11	50.0
Total	22	100.0
Intervention by employer		
Referred for treatment	1	4.6
No intervention by employer	3	13.6
Given time off work	1	4.6
Intervention not specified	2	9.1
Discarded	2	9.1
Missing	13	59.0
Total	22	100.0

5.3.4.3 Participants' responses on the types of musculoskeletal injuries sustained at work in the past 12 months

A sizeable 139 (15.0%) participants responded with a yes to having sustained a musculoskeletal injury, and 106 (76.3%) stated that they had back injuries. The other types of injuries and their statistical distribution are presented in figure 5.7.

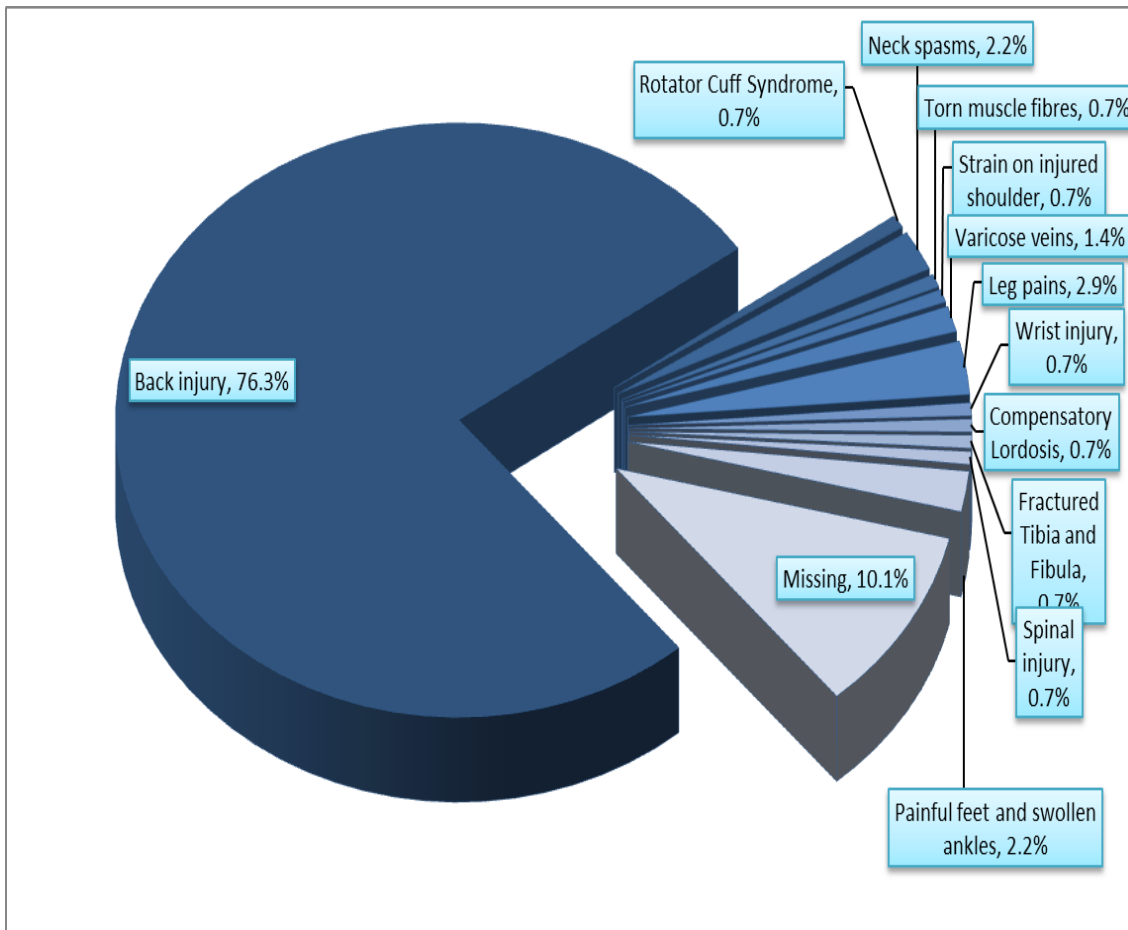


Figure 5.7 Participants' responses on the types of musculoskeletal injuries sustained at work in the past 12 months (n=139)

5.3.4.4 Are you on any chronic medication for a work-related injury or disease?

The participants who responded with a 'yes' were required to furnish information regarding the type of disease or injury for which chronic medication was being taken. Table 5.13 shows that hypertension with (32.0%) and backache (26.0%) as the conditions with the highest chronic medication.

Table 5.13 Responses regarding the type of injury/disease that the chronic medication was taken for (n=50)

Variable	n	%
Injury/disease for which chronic medication was taken		
Backache	13	26.0
Asthma	5	10.0
Hypertension	16	32.0
Work-induced stress	1	2.0
Allergy	3	6.0
Pulmonary Tuberculosis	1	2.0
Osteoarthritis of the spine	1	2.0
Damaged eyes	1	2.0
Sinusitis	1	2.0
MDR-TB	1	2.0
Depression	2	4.0
Anxiety	1	2.0
Lung problem	1	2.0
Cardiac condition	1	2.0
Discarded	1	2.0
Disease not disclosed	1	2.0
Total	50	100.0

5.3.5 Medical surveillance

Participants were required to respond with either a 'yes' or 'no' in this section. The provision of a 'yes' response was followed a request to furnish more information in order to clarify the answer.

The analysis indicates that 211 (22.8%) participants underwent medical screening upon their appointment and 678 (73.2%) were not screened, as captured in figure 5.8. The participants who underwent periodic medical assessment added up to 77 (8.3%), whilst 800 (86.4%) participants pointed out that they did not undergo periodic medical assessment at work. In addition, 24 (2.6%) participants underwent medical screening upon rotation from one unit to the other and those who were not screened on rotation amounted to 732 (79, 0%).



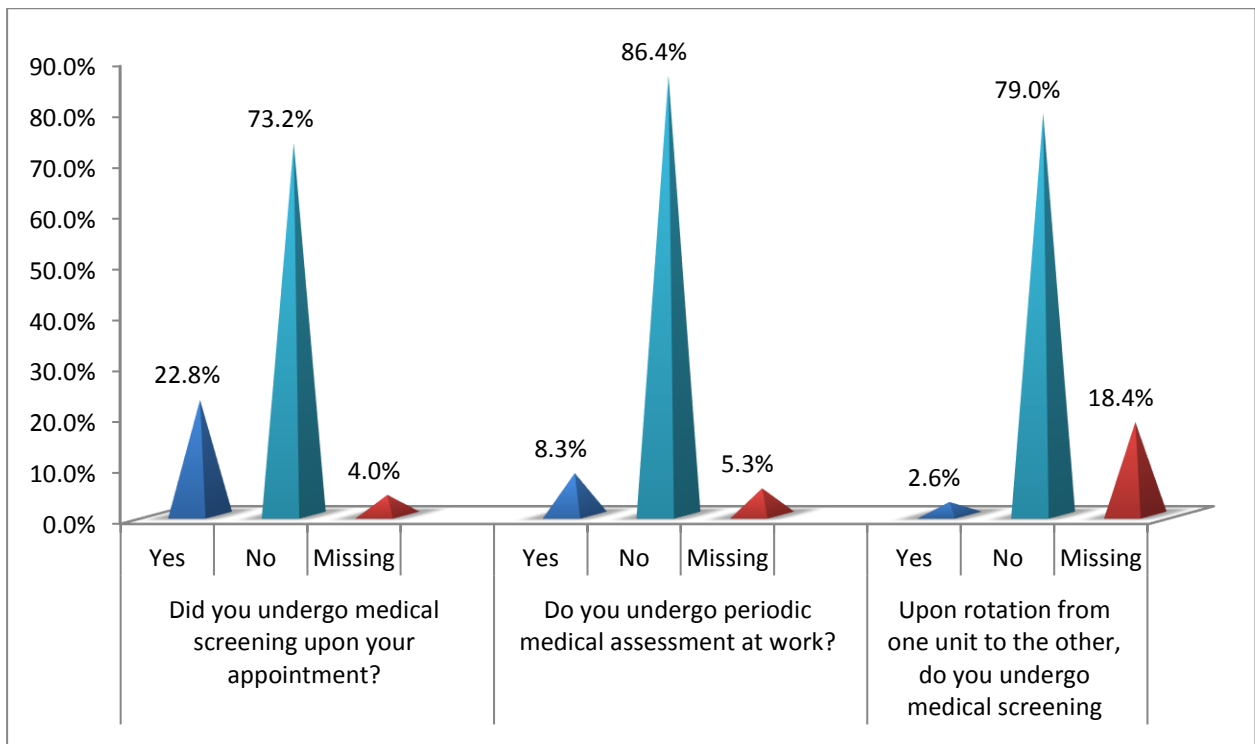


Figure 5.8 Summary of responses on medical surveillance (n=926)

5.3.5.1 Responses regarding the types of diseases that participants were screened for upon their appointment

The participants provided clarification on the types of diseases that they were screened for upon their appointment. The percentage distribution is 100% due to multiple responses, with participants indicating more than one type of disease. The disease most screened for was Hepatitis B (54.0%), followed by tuberculosis (33.6%), as presented in figure 5.9.

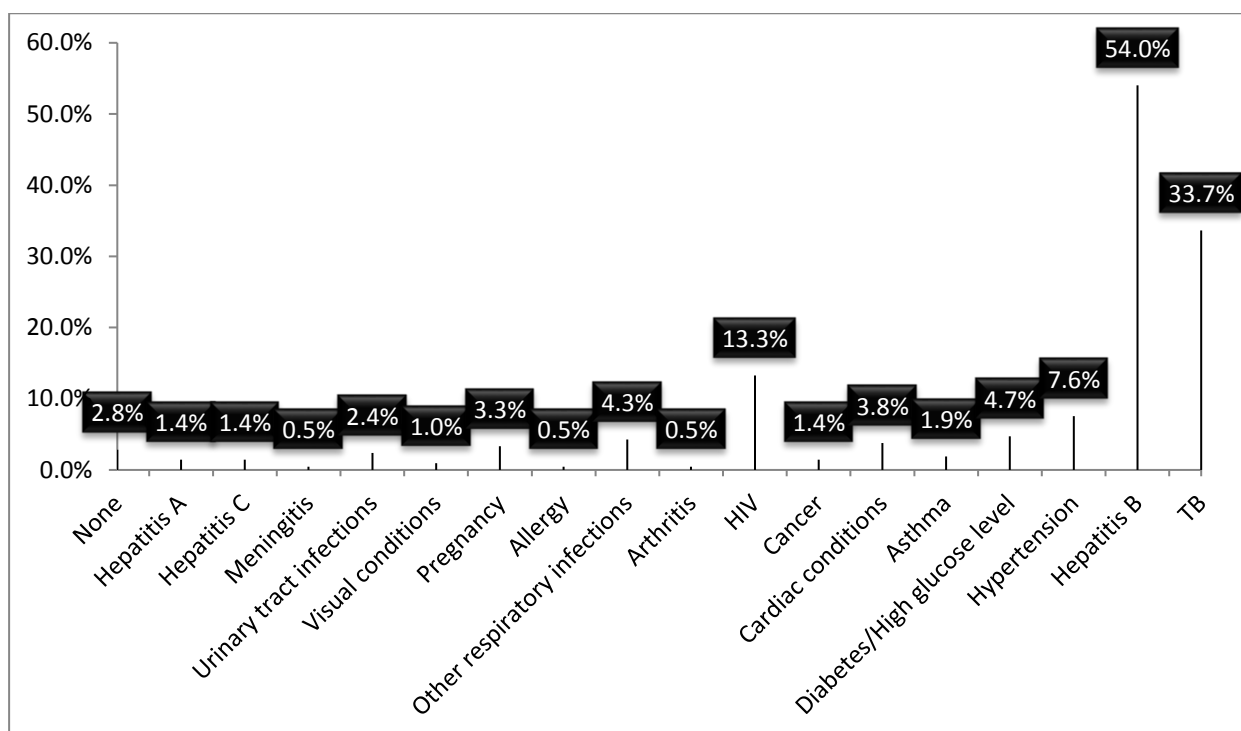


Figure 5.9 Responses regarding the types of diseases that participants were screened for upon their appointment (n=211)

5.3.5.2 Participants' periodic medical assessment intervals

Participants amounting to 8.3% of the total underwent periodic medical assessments and of these 57 (74.02%) indicated the time intervals of the medical assessments as presented in table 5.14.

Table 5.14 Participants' periodic medical assessment intervals (n=77)

Variable	n	%
Intervals of periodic medical assessments		
Monthly	1	1.3
3-monthly	7	9.1
5-monthly	1	1.3
6-monthly	10	13.0
Randomly	3	3.9
Last assessment was 2 years ago	3	3.9
Yearly	21	27.2
5-yearly	4	5.2
Done if there is a complaint	2	2.6
Interval not specified	5	6.5
Missing	20	26.0
Total	77	100.0

5.3.5.3 Diseases for which participants were screened upon rotation from one unit to the other

The diseases for which the participants were screened for appear in figure 5.10 as reported by the participants who had a 'yes' response. Tuberculosis screening had 5 (20.8%) participants, followed by unspecified hepatitis which had 3 (12.5%).

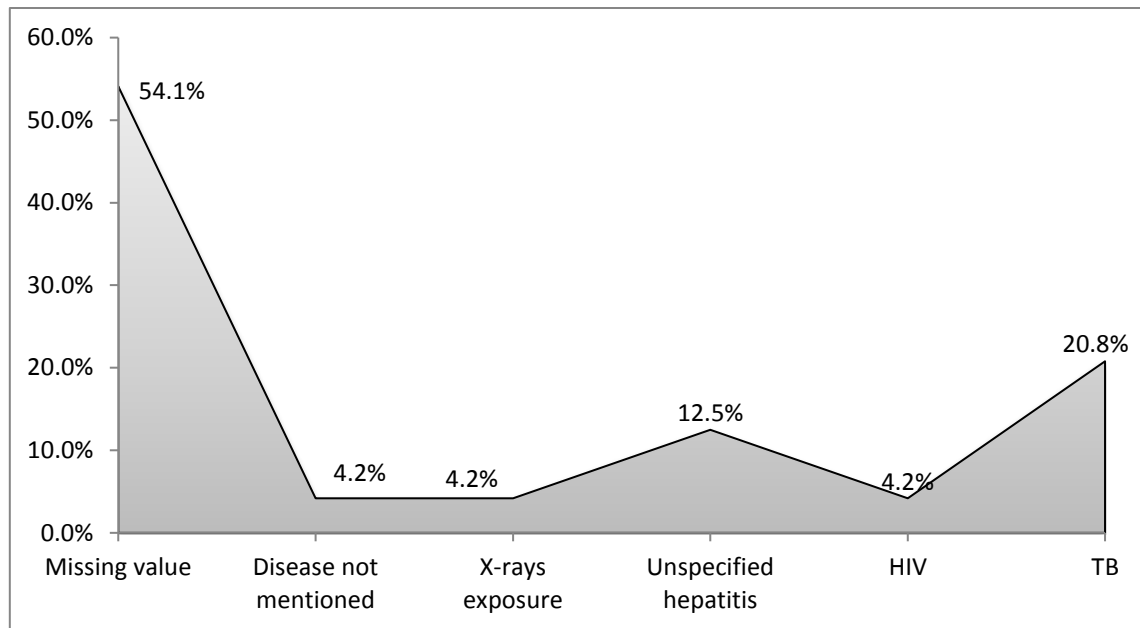


Figure 5.10 Diseases for which participants were screened upon rotation from one unit to the other (n=24)

5.3.6 Workplace safety

This section consisted of five Items which required a 'yes' or no response. Sometimes participants were required to elaborate further on the choice of response they would have made.

Table 5.15 demonstrates that 626 (67.6%) of the participants received training on workplace hazards. The analysis also revealed that 729 (78.7%) participants were provided with the necessary PPE for performance of duties, whilst 140 (15.1%) were not. A total of 599 (64.7%) participants received training on the use of PPE, and 448 (48.4%) participants indicated that safety inspections were periodically conducted in their units.

Of the participants, 473 (51.1%) indicated that there was management commitment and support towards the enhancement of OHS, whilst 297 (32.1%) did not agree.

Table 5.15 Summary of responses on workplace safety (n=926)

Variable	n	%
Do you receive training related to hazards in your work?		
Yes	626	67.6
No	230	24.8
Missing	70	7.6
Total	926	100.0
Are you provided with the necessary personal protective equipment (PPE) needed in the performance of your duties?		
Yes	729	78.7
No	140	15.1
Missing	57	6.2
Total	926	100.0
Do you get training on the use of PPE?		
Yes	599	64.7
No	253	27.3
Missing	74	8.0
Total	926	100.0
Are safety inspections periodically done in your unit?		
Yes	448	48.4
No	378	40.8
Missing	100	10.8
Total	926	100.0
Would you say there is managerial commitment and support to enhance the health and safety of health care workers in your unit?		
Yes	473	51.1
No	297	32.1
Missing	156	16.8
Total	926	100.0

5.3.6.1 Responses regarding who conducted the safety inspections

The participants who had made a 'yes' response were required to furnish further information regarding the person who had conducted the safety inspections and whether they got feedback on the outcome of the inspections. The analysis regarding who conducted the inspections are captured in figure 5.11. The responses to the item were multiple, resulting in higher percentages.

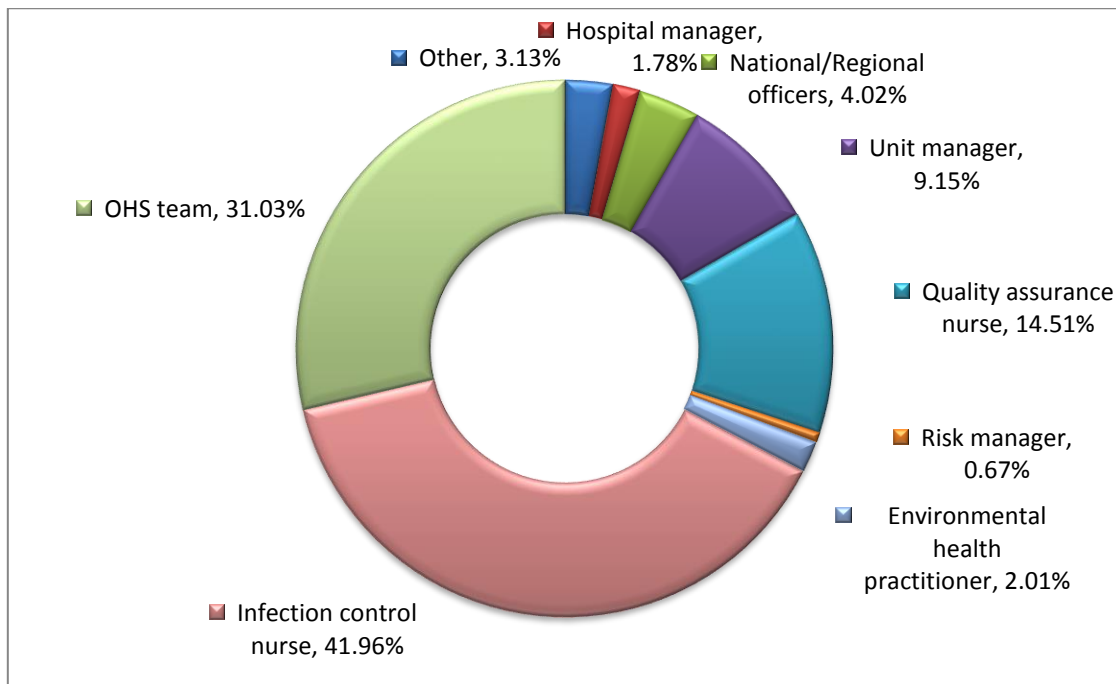


Figure 5.11 Distribution of responses regarding who conducted the inspections (n=448)

A follow-up item on whether participants received feedback on the outcome of the safety inspections reveals that 444 (99.1%) participants received feedback on the outcome of the inspections, whilst 4 (0.9%) not receive feedback on the inspection outcomes.

5.3.6.2 Participants' responses explaining lack of managerial commitment and support towards OHS for HCWs in the institution (n=297)

The participants who answered 'no' were required to explain their responses further. Multiple responses were provided resulting in percentage total of 100.%, and the responses were grouped and have been captured in figure 5.12.

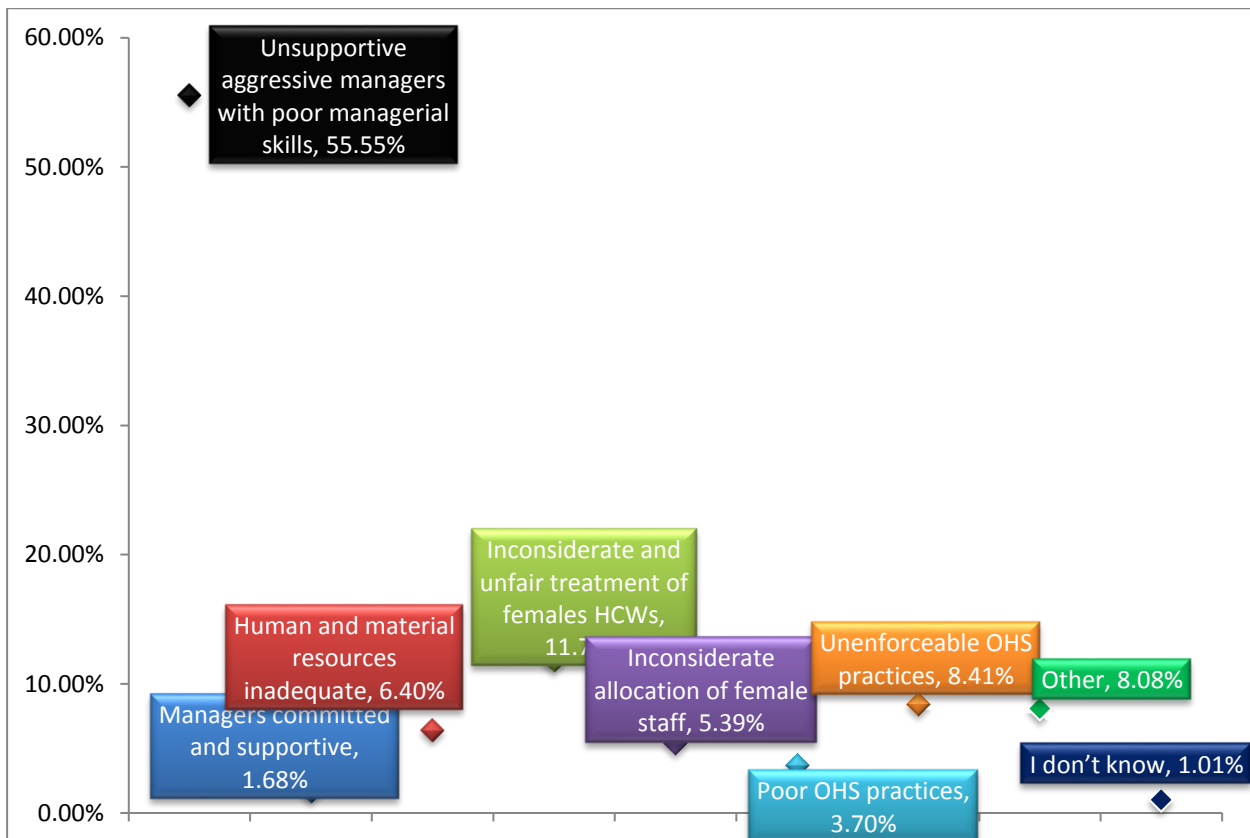


Figure 5.12 Participants' responses explaining lack of managerial commitment and support towards OHS for HCWs in the institution (n=297)

Worker perspectives

This section is presented in the thematic analysis section. The responses to the last two items in the questionnaire did not have a 'yes' or 'no' response and have been quantified, coded and presented in a thematic narrative, as the questions were completely open-ended and yielded large amounts of data.

5.3.7 The measure of association between participants' demographic factors and biological hazards

This section presents the measure of association between the nurses' demographic factors and biological hazards per item statement. The association was measured using the Fischer Exact test and a Chi-square application per block. P-values of ≤ 0.05 signify an association between variables, whilst P-values of > 0.05 indicate that no association exists between nurses' demographic factors and the biological hazards.

5.3.7.1 Association between participant's demographics and experiences of a needle stick injury (NSI) at work in the past twelve months

Data analysis, as presented in table 5.16, indicates a significant association ($p=0.022$) between nursing category and experiences of NSI, where 37 (50.0%) of the NSI occurred among professional nurses, and 6 (8.1%) among student nurses. There were no associations between NSI and other demographics.

Table 5.16 A summary of association between participants' demographics and experiences of needle stick injury (NSI) at work in the past twelve months (n=926)

Variable	Total	Have you experienced a needle prick injury at work in the past 12 months?		P-value
		Yes	No	
Participants' age group				
Below 20	1	0	1	0.804*
20-29	215	19	196	
30-39	217	14	203	
40-49	231	20	211	
50-59	192	17	175	
60+	28	3	25	
Missing	42	73	811	
Marital status				
Divorced	80	9	71	0.370**
Engaged	28	4	24	
Living together	70	9	61	
Married	290	21	269	
Single	394	31	363	
Widowed	28	1	27	
Missing	36	75	815	
Race				
Black	808	66	742	0.106*
Coloured	25	1	24	
Indian	7	0	7	
White	45	5	40	
Other	4	2	2	
Missing	37	74	815	
Nursing category				
Auxiliary nurses	178	11 (14.9)	167 (20.5)	0.022**
Enrolled nurses	168	12 (16.2)	156 (19.1)	
Nurse managers	105	8 (10.8)	97 (11.9)	
Professional nurses	296	37 (50.0)	259 (31.7)	

Variable	Total	Have you experienced a needle prick injury at work in the past 12 months?		P-value
		Yes	No	
Student nurses	143	6 (8.1)	137 (16.8)	
Missing	36	74 (100)	816 (100)	
Type of hospital				
Central	268	30	238	0.134**
District	277	19	258	
Regional	186	13	173	
Discard	2			
Missing	193	62	669	
Type of unit				
Out-Patients Department	79	5	74	0.368**
Casualty	85	12	73	
Maternity	67	9	58	
Medical wards	140	12	128	
Paediatric wards	92	6	86	
Surgical wards	173	10	163	
Theatre	56	5	51	
Wellness	14	2	12	
Other	172	13	159	
Missing	48	74	804	
Years of experience in unit				
<1year	7	1	6	0.839**
1-3	364	30	334	
4-6	122	14	108	
7-9	92	8	84	
10 years+	205	18	187	
Missing	135	71	719	
Discard	1			
Years of experience in health care industry				
0-10	475	38	437	0.871**
11-20	159	12	147	
21-30	173	16	157	
31-40	71	8	63	
41+	9	1	8	
Discard	1			
Missing	38	75	812	

* Fisher Exact test

** Chi-squared test

5.3.7.2 Association between participants' demographics and their experiences regarding negligent disposal of used needles

Table 5.17 demonstrates a significant association ($p=0.002$) between nurses' age groups and the negligent disposal of used needles. The 20-29 years age group experienced 111 (31.01%) incidents of negligently exposed needles. An association was further found to exist between race and negligent disposal of used needles at ($p=0.007$), where Black nurses had the highest incidents 312 (87.15%) of negligent disposal of used needles. The nursing category was significantly associated with the negligent disposal of used needles with a value of ($p<0.001$). Professional nurses had high, 145 (40.3%), experiences of negligent disposal of used needles, while and the group with the least incidents were nurse managers, with 52 (14.4%). The negligent disposal of used needles was associated further with the type of unit ($p=0.021$), surgical wards had 67 (18.8%), and Wellness 4 (1.1%) incidents.

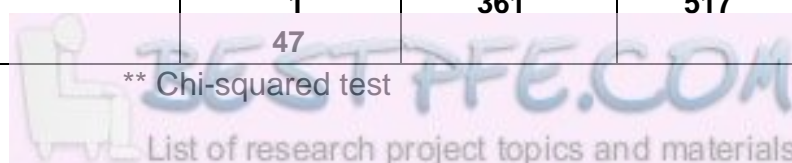
Table 5.17 A summary of association between participants' demographics and experiences of negligent disposal of used needles (n=926)

Variable	Total	Have you experienced negligent disposal of used needles? (n=926)		P-value
		Yes	No	
Participants' age group				0.002**
Below 20	1	1 (0.2)	0 (0.0)	
20-29	216	111 (31.0)	105 (20.2)	
30-39	216	89 (24.9)	127 (24.4)	
40-49	230	87 (24.3)	143 (27.5)	
50-59	189	60 (16.8)	129 (24.8)	
60+	26	10 (2.8)	16 (3.1)	
Missing	48	358 (100)	520 (100)	
Marital status				0.419**
Divorced	80	30	50	
Engaged	29	15	14	
Living together	70	25	45	
Married	284	111	173	
Single	394	169	225	
Widowed	27	8	19	
Missing	42	358	526	
Race				0.007*
Black	801	312 (87.1)	489 (93.1)	
Coloured	25	12 (3.4)	13 (2.5)	
Indian	7	2 (0.6)	5 (1.0)	
White	45	29 (8.1)	16 (3.0)	

Variable	Total	Have you experienced negligent disposal of used needles? (n=926)		P-value
		Yes	No	
Other	5	3 (0.8)	2 (0.4)	
Missing	43	358 (100)	525 (100)	
Nursing category				
Auxiliary nurses	175	55 (15.3)	120 (22.9)	<0.001**
Enrolled nurses	167	52 (14.4)	115 (22.0)	
Nurse managers	103	52 (14.4)	51 (9.7)	
Professional nurses	293	145 (40.3)	148 (28.2)	
Student nurses	146	56 (15.6)	90 (17.2)	
Missing	42	360 (100)	524 (100)	
Type of hospital				
Central	263	111	152	0.259**
District	278	101	177	
Regional	182	78	104	
Discard	2	290	433	
Missing	201			
Type of unit				
Out-Patients Department	80	23 (6.5)	57 (11.1)	0.021**
Casualty	83	47 (13.2)	36 (7.0)	
Maternity	68	30 (8.4)	38 (7.4)	
Medical wards	138	63 (17.7)	75 (14.7)	
Paediatric wards	92	39 (11.0)	53 (10.4)	
Surgical wards	169	67 (18.8)	102 (19.9)	
Theatre	58	19 (5.3)	39 (7.6)	
Wellness	14	4 (1.1)	10 (2.0)	
Other	166	64 (18.0)	102 (19.9)	
Missing	58	356 (100)	512 (100)	
Years of experience in unit				
<1year	7	3	4	0.529**
1-3	358	161	197	
4-6	121	51	70	
7-9	70	24	46	
10+	222	90	132	
Discard	1	329	449	
Missing	147			
Years of experience in health care industry				
0-10	472	208	264	0.114**
11-20	159	56	103	
21-30	170	63	107	
31-40	68	32	36	
41+	9	2	7	
Discard	1	361	517	
Missing	47			

* Fisher Exact test

** Chi-squared test



5.3.7.3 Association between participants' demographics and their experiences of splashes from patients' infected blood or other body fluids in the past twelve months

Splashes from patients' infected blood or body fluids were significantly associated with marital status ($p=0.024$), and race ($p=0.018$). More incidents of splashes occurred among nurses with single status 42 (50.0%) and the least among the widowed 1(1.2%). Race was another demographic factor that showed association ($p=0.018$) with splashes from patients' infected blood and body fluids, where Black nurses (83.1%) were highly linked to splashes. Other demographics were not significantly associated with splashes from patients' infected blood or body fluids, refer to table 5.18.

Table 5.18 A summary of association between participants' demographics and experiences of splashes from patients' infected blood or other body fluids in the past twelve months (n=926)

Variable	Total	Have you experienced splashes from patients' infected blood or other body fluids in the past twelve months? (n=926)		P-value
		Yes	No	
Participants' age group				
Below 20	1	0	1	0.590*
20-29	215	27	188	
30-39	211	18	193	
40-49	227	18	209	
50-59	188	18	170	
60+	27	2	25	
Missing	57	83	786	
Marital status				
Divorced	79	9 (10.7)	70 (8.86)	0.024**
Engaged	27	2 (2.4)	25 (3.17)	
Living together	69	3 (3.6)	66 (8.35)	
Married	282	27 (32.1)	255 (32.28)	
Single	390	42 (50.0)	348 (44.05)	
Widowed	27	1 (1.2)	26 (3.29)	
Missing	52	84 (100)	790 (100)	
Race				
Black	792	69 (83.13)	723 (91.52)	0.018*
Coloured	25	2 (2.41)	23 (2.91)	
Indian	7	1 (1.21)	6 (0.76)	

Variable	Total	Have you experienced splashes from patients' infected blood or other body fluids in the past twelve months? (n=926)		P-value
		Yes	No	
White	44	11 (13.25)	33 (4.18)	
Other	5	0 (0.00)	5 (0.63)	
Missing	53	83 (100)	790 (100)	
Nursing category				0.153**
Auxiliary nurses	172	11	161	
Enrolled nurses	162	11	151	
Nurse managers	101	9	92	
Professional nurses	295	35	260	
Student nurses	144	18	126	
Missing	52	84	790	
Type of hospital				0.265**
Central	257	29	228	
District	277	21	256	
Regional	180	14	166	
Discard	2	64	650	
Missing	210			
Type of unit				0.719**
Out-Patients Department	79	5	74	
Casualty	83	9	74	
Maternity	68	8	60	
Medical wards	133	13	120	
Paediatric wards	90	9	81	
Surgical wards	166	17	149	
Theatre	57	7	50	
Wellness	14	3	11	
Other	168	13	155	
Missing	68	84	774	
Years of experience in unit				0.970**
<1year	7	1	6	
1-3	353	34	319	
4-6	118	13	105	
7-9	69	7	62	
10+	222	20	202	
Discard	1	75	694	
Missing	156			
Years of experience in health care industry				0.714**
0-10	465	46	419	
11-20	155	12	143	
21-30	170	19	151	
31-40	68	7	61	
41+	9	0	9	
Discard	1	84	783	

Variable	Total	Have you experienced splashes from patients' infected blood or other body fluids in the past twelve months? (n=926)		P-value
		Yes	No	
Missing	58			

* Fisher Exact test

** Chi-squared test

5.3.7.4 Association between participants' demographics factors and constant exposure to biological agents in your unit

Significant associations were formed between constant exposure to hazardous biological agents (HBAs) in the nursing unit and nursing category ($p=0.001$). Professional nurses were highly linked 231 (38.6%) to exposure to HBAs, and the lowest linked were nurse managers 69 (11.52%). Regarding type of unit and constant exposure to hazardous biological agents (HBAs), the significant association was ($p<0.001$), with the highest incidents in medical wards 114 (19.2%) and the lowest in Wellness 9 (1.5%) as captured in table 5.19.

Table 5.19 A summary of association between participants' demographics and constant exposure to biological agents in your unit (n=926)

Variable	Total	Are you in constant exposure to biological agents in your unit? (n=926)		P-value
		Yes	No	
Participants' age group				
Below 20	1	1	0	0.215**
20-29	207	150	57	
30-39	205	154	51	
40-49	226	149	77	
50-59	187	123	64	
60+	26	19	7	
Missing	74	596	256	
Marital status				
Divorced	80	54	26	0.266**
Engaged	28	22	6	
Living together	70	45	25	
Married	280	184	96	
Single	373	273	100	
Widowed	27	19	8	

Variable	Total	Are you in constant exposure to biological agents in your unit? (n=926)		P-value
		Yes	No	
Missing	68	597	261	
Race				
Black	777	534	243	0.204*
Coloured	25	18	7	
Indian	6	4	2	
White	45	37	8	
Other	5	5	0	
Missing	68	598	260	
Nursing category				
Auxiliary nurses	169	109 (18.2)	60 (23.2)	0.001**
Enrolled nurses	158	104 (17.3)	54 (20.8)	
Nurse managers	101	69 (11.5)	32 (12.4)	
Professional nurses	292	231 (38.6)	61 (23.5)	
Student nurses	138	86 (14.4)	52 (20.1)	
Missing	68	599 (100)	259 (100)	
Type of hospital				
Central	258	186	72	0.528*
District	269	183	86	
Regional	179	122	57	
Discard	2	491	215	
Missing	218			
Type of unit				
Out-Patients Department	79	48 (8.1)	31 (12.2)	<0.001**
Casualty	84	61 (10.3)	23 (9.1)	
Maternity	66	55 (9.3)	11 (4.3)	
Medical wards	135	114 (19.2)	21 (8.3)	
Paediatric wards	88	65 (11.0)	23 (9.0)	
Surgical wards	158	93 (16.0)	65 (25.6)	
Theatre	58	37 (6.2)	21 (8.3)	
Wellness	13	9 (1.5)	4 (1.5)	
Other	164	109 (18.4)	55 (21.7)	
Missing	81	591 (100)	254 (100)	
Years of experience in unit				
< 1year	6	3	3	0.508**
1-3	344	254	90	
4-6	118	83	35	
7-9	69	46	23	
10+	222	156	66	
Missing	167	542	217	
Years of experience in health care industry				
0-10	453	315	138	0.360**
11-20	156	101	55	
21-30	168	126	42	
31-40	68	48	20	

Variable	Total	Are you in constant exposure to biological agents in your unit? (n=926)		P-value
		Yes	No	
41+	9	7	2	
Discard	1	597	257	
Missing	71			

* Fisher Exact test

** Chi-squared test

5.3.7.5 Association between participants' demographics factors and constant contact with medical waste

Constant contact with medical waste was significantly associated ($p < 0.001$) with the nursing category. A total of 230 (41.0%) professional nurses had various incidents with medical waste contact, while nurse managers had and those with the least (14.4%) contact. The type of unit and constant medical waste contact were associated significantly ($p < 0.001$), as shown in table 5.20. Surgical wards 102 (18.3%) had the highest links with constant medical waste contact, whereas Wellness had the lowest incidents at 3 (0.54%). Constant contact with medical waste and years of experience in the unit were associated significantly ($p < 0.001$), with those possessing 1-3 years' experience having the highest incidents 228 (44.4%). Thus, the years of experience in the health care industry were also significantly associated ($p < 0.001$) with constant contact to medical waste. Further associations are presented in table 5.20.

Table 5.20 A summary of association between participants' demographics and constant contact with medical waste (n=926)

Variable	Total	Are you in constant contact with medical waste? (n=926)		P-value
		Yes	No	
Participants' age group				
Below 20	1	1	0	0.442**
20-29	203	135	68	
30-39	203	133	70	
40-49	217	144	73	
50-59	179	133	46	
60+	25	17	8	
Missing	98	563	265	
Marital status				
Divorced	75	54	21	0.756**

Variable	Total	Are you in constant contact with medical waste? (n=926)		P-value
		Yes	No	
Engaged	27	18	9	
Living together	70	49	21	
Married	265	178	87	
Single	372	249	123	
Widowed	25	20	5	
Missing	92	568	266	
Race				
Black	753	505	248	0.059*
Coloured	25	17	8	
Indian	7	6	1	
White	44	37	7	
Other	5	5	0	
Missing	92	570	264	
Nursing category				
Auxiliary nurses	155	87 (15.0)	68 (25.5)	<0.001**
Enrolled nurses	148	86 (15.0)	62 (23.2)	
Nurse managers	103	82 (14.4)	21 (7.9)	
Professional nurses	292	230 (41.0)	62 (23.2)	
Student nurses	137	83 (14.6)	54 (20.2)	
Missing	91	568 (100)	267 (100)	
Type of hospital				
Central	256	187	69	0.187*
District	256	168	88	
Regional	175	120	55	
Discard	1	475	212	
Missing	238			
Type of unit				
Out-Patients Department	78	38 (6.8)	40 (15.4)	<0.001**
Casualty	78	50 (9.0)	28 (10.8)	
Maternity	64	53 (9.5)	11 (4.2)	
Medical wards	129	98 (17.5)	31 (11.9)	
Paediatric wards	85	52 (9.3)	33 (12.7)	
Surgical wards	156	102 (18.3)	54 (20.8)	
Theatre	54	40 (7.2)	14 (5.4)	
Wellness	13	3 (0.5)	10 (3.8)	
Other	161	122 (21.9)	39 (15.0)	
Missing	108	558 (100)	260 (100)	
Years of experience in unit				
< 1year	6	4 (0.8)	2 (1.6)	<0.001**
1-3	339	228 (44.4)	11 (8.7)	
4-6	113	70 (13.6)	43 (34.1)	
7-9	67	45 (8.7)	22 (17.5)	
10+	215	167 (32.5)	48 (38.1)	
Missing	186	514 (100)	126 (100)	

Variable	Total	Are you in constant contact with medical waste? (n=926)		P-value
		Yes	No	
Years of experience in health care industry				<0.001**
0-10	440	277 (49.2)	163 (61.3)	
11-20	151	96 (17.0)	55 (20.7)	
21-30	164	132 (23.5)	32 (12.0)	
31-40	65	49 (8.7)	16 (6.0)	
41+	9	9 (1.6)	0 (0.0)	
Discard	1	563 (100)	266 (100)	
Missing	96			

* Fisher Exact test

** Chi-squared test

5.3.7.6 Association between participants' demographics factors and the effectiveness of medical waste disposal methods used in their organisation

None of the demographic factors had a significant association with the effectiveness of medical waste disposal methods used in the participants' hospitals, as shown in table 5.21.

Table 5.21 A summary of the association between participants' demographics and the effectiveness of medical waste disposal methods used in their organisation (n=926)

Variable	Total	Are the medical waste disposal methods used in your organisation effective? (n=926)		P-value
		Yes	No	
Participants' age group				0.670**
Below 20	1	1	0	
20-29	209	179	30	
30-39	207	169	38	
40-49	227	191	36	
50-59	188	162	26	
60+	25	23	2	
Missing	69	725	132	
Marital status				0.104**
Divorced	78	70	8	
Engaged	28	19	9	

Variable	Total	Are the medical waste disposal methods used in your organisation effective? (n=926)		P-value
		Yes	No	
Living together	70	61	9	
Married	275	228	47	
Single	386	330	56	
Widowed	26	23	3	
Missing	63	731	132	
Race				0.318*
Black	781	659	122	
Coloured	25	24	1	
Indian	7	5	2	
White	45	39	6	
Other	5	4	1	
Missing	63	731	132	
Nursing category				0.299*
Auxiliary nurses	173	150	23	
Enrolled nurses	157	136	21	
Nurse managers	102	85	17	
Professional nurses	288	234	54	
Student nurses	143	126	17	
Missing	63	731	132	
Type of hospital				0.567*
Central	259	214	45	
District	269	228	41	
Regional	179	145	34	
Discard	2	587	120	
Missing	217			
Type of unit				0.179**
Out-Patients Department	79	62	17	
Casualty	82	64	18	
Maternity	63	52	11	
Medical wards	134	110	24	
Paediatric wards	90	79	11	
Surgical wards	163	145	18	
Theatre	56	50	6	
Wellness	14	12	2	
Other	166	146	20	
Missing	79	720	127	
Years of experience in unit				0.155*
< 1year	6	6	0	
1-3	353	304	49	
4-6	115	103	12	
7-9	67	52	15	
10+	219	181	38	
Discard	1	646	114	

Variable	Total	Are the medical waste disposal methods used in your organisation effective? (n=926)		P-value
		Yes	No	
Missing	165			
Years of experience in health care industry				0.435*
0-10	457	394	63	
11-20	152	122	30	
21-30	171	147	24	
31-40	66	54	12	
41+	9	9	0	
Discard	1	726	129	
Missing	70			

* Fisher Exact test

** Chi-squared test

5.3.7.7 Association between participants' demographic factors and accidental exposure to hazardous drugs

An association ($p=0.033$) existed between race and accidental exposure to hazardous drugs, with 21 (80.8%) Blacks having the most exposure. The type of hospital was significantly associated ($p=0.013$) with accidental exposure to hazardous drugs. Central hospitals had high incidents 12 (60.00%) of exposure to hazardous drugs. See table 5.22 for presentation of data.

Table 5.22 A summary of the association between participants' demographics and accidental exposure to hazardous drugs in the past twelve months (n=926)

Variable	Total	Have you had accidental exposure to hazardous drugs in the past twelve months? (n=926)		P-value
		Yes	No	
Participants' age group				0.698**
Below 20	1	0	1	
20-29	214	7	207	
30-39	217	4	213	
40-49	232	8	224	
50-59	189	5	184	
60+	28	2	26	
Missing	45	26	855	

Variable	Total	Have you had accidental exposure to hazardous drugs in the past twelve months? (n=926)		P-value
		Yes	No	
Marital status				
Divorced	78	4	74	0.573**
Engaged	29	1	28	
Living together	71	2	69	
Married	287	6	281	
Single	394	11	383	
Widowed	28	2	26	
Missing	39	26	861	
Race				
Black	805	21 (80.8)	784 (91.0)	0.033*
Coloured	25	1 (3.8)	24 (2.8)	
Indian	7	2 (7.7)	5 (0.6)	
White	45	2 (7.7)	43 (5.0)	
Other	5	0 (0.0)	5 (0.6)	
Missing	39	26 (100)	861 (100)	
Nursing category				
Auxiliary nurses	174	3	171	0.058*
Enrolled nurses	167	1	166	
Nurse managers	103	2	101	
Professional nurses	298	15	283	
Student nurses	145	5	140	
Missing	39	26	861	
Type of hospital				
Central	263	12 (60.0)	251 (35.6)	0.013*
District	277	2 (10.0)	275 (39.0)	
Regional	185	6 (30.0)	179 (25.4)	
Discard	2	20 (100)	705 (100)	
Missing	199			
Type of unit				
Out-Patients Department	80	1	79	0.467**
Casualty	83	4	79	
Maternity	67	1	66	
Medical wards	139	5	134	
Paediatric wards	92	0	92	
Surgical wards	167	8	159	
Theatre	58	2	56	
Wellness	14	0	14	
Other	170	5	165	
Missing	56	26	844	
Years of experience in unit				
< 1year	6	0	6	0.333*
1-3	359	11	348	
4-6	122	2	120	
	70	0	70	

Variable	Total	Have you had accidental exposure to hazardous drugs in the past twelve months? (n=926)		P-value
		Yes	No	
7-9	224	10	214	
10+	1	23	758	
Discard Missing	144			
Years of experience in health care industry				0.127*
0-10	471	10	461	
11-20	159	6	153	
21-30	172	4	168	
31-40	69	4	65	
41+	9	1	8	
Discard Missing	1 45	25	855	

* Fisher Exact test

** Chi-squared test

5.3.7.8 Association between the participants' demographic factors and experiences of unwanted reactions from the use of latex gloves

An association existed ($p=0.034$) between the nursing category and unwanted reactions from the use of latex gloves. The analysis shows that 46.5% of the professional nurses were linked with reactions from the use of latex gloves 33 (46.48%). A significant association ($p=0.003$) existed between unwanted reactions from the use of latex gloves and the years of experience in the health care industry. Unwanted reactions were linked more to participants, in this case numbering 34 (46.5%), with 0-10 years of experience. Table 5.23, below presents these and other details.

Table 5.23 A summary of the association between participants' demographics and experiences of unwanted reactions from the use of latex gloves in the past twelve months (n=926)

Variable	Total	Did you at any time experience unwanted reactions from the use of latex gloves in the past twelve months? (n=926)		P-value
		Yes	No	
Participants' age group				
Below 20	1	0	1	0.060*
20-29	213	18	195	
30-39	213	13	200	
40-49	230	18	212	
50-59	190	15	175	
60+	27	7	20	
Missing	52	71	803	
Marital status				
Divorced	81	8	73	0.342**
Engaged	26	0	26	
Living together	70	8	62	
Married	283	20	263	
Single	392	32	360	
Widowed	27	4	23	
Missing	47	72	807	
Race				
Black	797	62	735	0.088*
Coloured	25	1	24	
Indian	7	0	7	
White	45	9	36	
Other	5	0	5	
Missing	47	72	807	
Nursing category				
Auxiliary nurses	170	6 (8.4)	164 (20.3)	0.034*
Enrolled nurses	163	11 (15.5)	152 (18.8)	
Nurse managers	105	11 (15.5)	94 (11.6)	
Professional nurses	296	33 (46.5)	263 (32.6)	
Student nurses	145	10 (14.1)	135 (16.7)	
Missing	47	71 (100)	808 (100)	
Type of hospital				
Central	261			0.424*
District	276	18	243	
Regional	182	23	253	
Discard	2	19	163	
Missing	205	60	659	

Variable	Total	Did you at any time experience unwanted reactions from the use of latex gloves in the past twelve months? (n=926)		P-value
		Yes	No	
Type of unit				
Out-Patients Department	79	6	73	0.311**
Casualty	85	5	80	
Maternity	65	7	58	
Medical wards	137	10	127	
Paediatric wards	92	8	84	
Surgical wards	168	12	156	
Theatre	57	5	52	
Wellness	14	4	10	
Other	168	14	154	
Missing	61	71	794	
Years of experience in unit				
<1 year	7	0	7	0.655*
1-3	360	27	333	
4-6	119	9	110	
7-9	69	5	64	
10+	221	24	197	
Discard	1	65	711	
Missing	149			
Years of experience in health care industry				
0-10	469	34 (46.5)	435 (54.2)	0.003*
11-20	156	10 (13.7)	146 (18.2)	
21-30	172	13 (17.8)	159 (20.0)	
31-40	70	16 (22.0)	54 (6.7)	
41+	8	0 (0.0)	8 (0.9)	
Discard	1	73 (100)	802 (100)	
Missing	50			

* Fisher Exact test

** Chi-squared test

5.4 PRESENTATION OF PARTICIPANTS' OPEN-ENDED RESPONSES (SELF ADMINISTERED QUESTIONNAIRE)

This section focuses on the analysis of the participants' responses to open-ended questions. The responses are quantified and presented as narratives derived from the participants' open-ended responses regarding biological hazards, work-related injuries and diseases and aspects related to the workplace safety conditions or context. Findings of the analysis of open-ended responses is also presented within the psychosocial work environment avenue and promotion of good working life by addressing OHS challenges.

5.4.1 Contamination with HBAs within the nature and context of patient care delivery

5.4.1.1 Performance of clinical procedures

Almost a third of the participants 27.6% reported that contamination with hazardous biological agents (HBAs) occurred whilst carrying out in clinical procedures for diagnostic purposes, such as pricking a patient's finger for haemoglucotest (Hgt), HIV testing or haemoglobin (Hb) test, and during the collection of blood specimen. In some of the instances mentioned, a patient's HIV status was known to be positive as evidenced by participants who wrote:

“...while taking blood from an HIV (+) baby...”, “...accidental self-prick after pricking an HIV+ patient when putting up a drip...”, “...when putting blood in a blood specimen bottle...”

Majority of participants 32 (37.7%) who experienced splashes, reported cases of contamination from blood and body fluids which occurred during invasive clinical procedures such as wound care and the delivery of a baby. Experiences of contact with HBAs through splashes from patients' blood and or body fluids were due to self-action, the actions of colleagues or those of patients during patient care provision. The following written statements from the nurses accounted for such experiences:

“...assisting with delivery of a baby, amniotic fluid splashed in my face, hands and clothes...”, “...pus splashed into my eyes during slough removal...”, “...faecal splash during bowel washout...”, “...splashed by gastric contents of a patient infected with HIV...”

Other activities which were reported involved splashes of blood or secretions from endotracheal tube during intubation, while changing intercostal drainage, and due to splashes from patients' wounds. The following statements describe the splashes which occurred through the actions of colleagues:

“...blood splash in my eyes by a colleague during drip removal...”, “...blood being collected into the blood specimen bottle...”

Non-invasive procedures formed another significant group of activities that led to contamination with blood and body fluids through splashes, as reported by 14 (17.6%) of participants who experienced splashes. These contaminations were related to certain intended or unintended actions by patients, as exemplified in the statements written by participants:

“...male patient urinated in my shoe during bed bath...”, “...patient coughed out sputum in my hand...”, “...patient vomited in my face and clothes while giving him a bowl to vomit in...”

Other contamination was through contact with hazardous drugs which affected the eyes and skin of the HCWs.

5.4.1.2 Accidental sharps and needle stick injury (NSI) incidents

Incidents of needle stick injuries (NSI) were reported by 76 (8.2%) nurses, who highlighted many varied reasons for the NSI, as a result of accidental self-pricks (ASP). Almost a quarter these nurses experienced accidental self-pricks (ASP) related to incorrect disposal of sharps. Other common occurrences were during the re-capping a needle, while injecting a patient, when making preparations for injection giving and in incidences involving the flushing of a blocked intravenous infusion. However, other accidental incidences emanated from colleagues' or patients' actions which resulted in other colleagues being pricked. Written statements from participants include:

“...accidental prick during injection giving...”, “...when inserting a needle to a syringe...”, “...accidental prick by a colleague...”

Patients' behavior during care by the nurses accounted for some of the cases of contamination with hazardous biological agents (HBAs). A quarter of the nurses who reported incidents of NSI, further reported accidental self-pricks (ASP) being attributed to encounters with aggressive and uncooperative patients, and this is supported by documented statements such as:

“...when suturing an episiotomy of an uncooperative patient...”, “...physical aggression by patient leading to accidental self-prick after pricking the patient for Hgt...”, “...accidental self-prick when doing haemoglucotest (Hgt) from an uncooperative patient...”

5.4.1.3 Challenges to nurses regarding medical waste disposal

Above a tenth 133 (14.3%) of the nurses pointed out that the disposal methods used in their institutions to manage waste were not effective, and of these nurses, numerous factors relating to the management of waste were highlighted. A third of the nurses pointed out provision of correct equipment as a measure that can promote effective waste disposal in their hospitals. Almost a quarter of the nurses pointed to the necessity for compliance to waste disposal procedures.

Some factors relating to poor waste disposal include lack of adherence to waste removal procedures and standards, insufficient resources and the nature of some of the medical staff's attitudes. In some of the instances a needle would be found lying around and not properly disposed of, as was mentioned by individual participants in the statements:

“...a needle was left lying on a patient's bed after a doctor performed a cut down...”, “...needle lying on the floor...”

One fifth of the nurses suggested in-service training of staff as a way to improve waste disposal management, and some mentioned the need to address staff attitudes. Some ideas that came with in-service training included self-empowerment through reading material about waste management, and not only relying on someone to teach them. Nurses perceived this as another way that could assist nurses in gaining knowledge on waste disposal. The development of guidelines and introduction of training among staff were seen as essential and this should be complimented by patient teaching on waste disposal. The related responses include:

“...training on how unbroken medicine bottles, cups, cold drink bottles should be discarded...”, “...in-service training about waste disposal management...”, “...staff attitudes to be addressed...”, “...patient education on waste disposal...”

“...uniform guidelines be developed on how all hospitals should discard medicines and expired drugs from wards...”

Adherence to waste disposal procedures and standards was highlighted by a third of the participants as one of the ways that could assist in waste disposal management. Medical doctors were specifically identified as one group of non-compliers to waste disposal procedures. Those employed to provide clean waste collection material and collect used up material were also identified as a non-complying group. Adherence to universal standards of waste disposal and control of spread of infections must be complied to, by all and sundry. Less than a tenth of the participants 7 (5.0%) considered the implementation of harsh measures towards non-compliance as a way that could boost adherence. Some of the individual participants pointed out that:

“...segregation of waste materials be done correctly...”, “...overflow of buckets must be stopped...”, “...adherence to waste disposal procedures by doctors...”, “...reprimand those responsible for provision and collection of disposable material...”, “...red boxes to be collected in time and replaced...”

The provision of waste disposal resources was reported as a good practice towards improving waste disposal management. Nurses demanded an extra supply of required resources, such as colour-coded plastic bags, red bins for bloods, transparent plastics for municipal waste, and fixed sharps containers. It was also pointed out that a sustainable way to handle waste during weekends was also required. Some of the documented statements by nurses in this regard were as follows:

“...supply more bins and bags accordingly in different colours...”, “...sharp containers to be mounted on the walls...”, “...waste removal during weekends to be addressed...”

5.4.2 The context of occupational injuries and diseases occurrence

This section presents the participants' accounts regarding the occurrence of diseases and injuries in a period of twelve months in their current employment and the interventions by management to assist or support them during such experiences. The section also

considers the responses describing the type of injury or disease and the medication taken by participants who had ended up taking chronic medication after such encounters.

5.4.2.1 Occupational injuries occurrence

A total of 139 (15.0%) of nurses sustained musculoskeletal injuries. The incidences of injuries in the workplace were reported by nurses, in a twelve-month period in their current employment, dating back from the time when data was collected. The nature of the injuries was described and grouped into those that affected the torso, the upper extremities and the lower extremities. The torso was the mostly affected, with specific damages such as back injury, reported by the majority 106 (76.3%) of the nurses who reported to have sustained injuries at work. Spinal injury, head injury, shoulder and neck spasms, Rotator Cuff Syndrome, Compensatory Lordosis and face injuries were also reported. One nurse mentioned experiencing psychological trauma after sustaining a physical injury. This is what one nurse had to say about a head injury:

“...hit by a patient with a drip stand...”

The lower extremity injuries were reported by fewer nurses 10 (7.9%) and included a cut tendon, fractured tibia and fibula, injuries to the ankle and foot, injury to both knees, development of varicose veins, swollen painful feet and a fractured toe. The statements that were written by some participants include:

“...injured ankle...medicine trolley fell on me...”, “...injury right foot...hit by a cotbed...”, “...leg pains due to prolonged standing...”

Finally, the reported injuries to the upper extremities include wrist and finger injury, finger lacerations and a fractured thumb, and these were reported by much fewer nurses. In addition, one nurse wrote the following statement:

“...finger injury by door whilst assisting a patient...”

5.4.2.2 Occupational diseases occurrence

The participants who reported an occupational disease in the previous twelve months in their current employment were 22 (2.4%). They pointed out that they acquired at least one occupational diseases. Four nurses reported having acquired Tuberculosis (TB), and two reported lung infection, whilst other diseases contracted include influenza, chicken pox, allergic reaction, painful swollen legs and sore throat. One respondent pointed out that:

“...sore throat due to exposure to pseudomonas...”

5.4.2.3 Management interventions for occupational injuries and diseases

Varied measures were taken by the employer to assist nurses who experienced occupational injuries and or diseases. In 3 (13.6%) out of twenty-two cases of occupational diseases and 8 (21.1%) out of thirty-eight cases of occupational injury, no interventions were taken to assist workers. Instead, some reported to have been either rebuked or denied access to services. The statements that were made by participants to support this are:

“...I was told to accept the situation or leave...”, “...denied access to staff clinic because I am a student...”

Nearly one fifth 8 (21.1%) of the nurses who sustained injuries were referred for treatment, and or relieving the worker of the work pressure by placing them in other units, while others were given time off to rest at home. The specific statements made by the participants are:

“...referred to casualty and treated...”, “...moved from strenuous to less strenuous unit...”, “...was given occupational leave for two weeks...”, “...given time to rest at home...”

5.4.2.4 Chronic treatment related to occupational injuries and diseases

A minority of the nurses 50 (5.4%) reported to be on chronic medication for either an occupational injury or disease. Of these nurses, chronic medication was taken more for occupational diseases than occupational injuries. A third of the nurses 16 (32.0%) used chronic medication for hypertension (HT), whilst others used medication for pulmonary tuberculosis (PTB), asthma, work-induced stress, MDR-TB, depression, anxiety, lung and cardiac diseases, allergy and sinusitis. Almost another third of nurses 13 (26.0%) took medication for back injuries. Other injuries included damaged eyes and spine. Hypertension and backache seemed to be the most problematic among nurses as more nurses were reported to be on chronic medication for both conditions.

5.4.3 The context of workplace safety and OHS policy compliance

The key issues, safety and management factors, were identified after the grouping and categorisation of the participants' open-ended responses on OHS in their workplaces. The safety issues were grouped and discussed under lack of security, the handling of psychiatric patients, contagious diseases and workplace violence. The management factors that had an impact on the provision of OHS services were also grouped and presented under lack of intervention, lack of caring, lack of resources, non-provision of personal health services and the inappropriate placement of pregnant, sick and elderly nurses.

5.4.3.1 Lack of security

The majority of participants believed that their workplaces were not safe and lacked good security measures that will keep them safe as they carried patient care duties. They indicated a preference for male security personnel or even the services of the South African Police (SAPS) to secure the hospital premises and the ward entrances during the day and night. The following are some of their written comments:



“...employ lots of male security guards...”, “...24-hour security at all gates and corridors...”, “...SAPS needed in casualty and other wards...”, “...provision of alarms and CCTV for security...”, “...poor provision of male security at night...”, “...female nurses to be escorted by security personnel or male nurse during the night...”

5.4.3.2 Handling of psychiatric patients

The nurses also reported that the management of psychiatric patients is a safety challenge as these patients would exhibit difficult and violent tendencies. Another challenge was that many nurses who were not trained in psychiatry were made to take care of such patients, and these were collective statements that were commonly reported:

“...staff not qualified to handle psychiatric patients but delegated by management to nurse them...”, “...there is a possibility of rape of female nurses by psychiatric patients...”, “...placing psychiatric patients in non-psychiatric wards with nurses who do not have the skill to handle them...”

5.4.3.3 Contagious diseases

The issue of risks of exposure to workplace contagious diseases was raised by few of the participants. Some of the individual responses are:

“...proper patient screening procedures be put in place for those with infectious diseases...”, “...exposure to hazardous biological agents is a problem...”

5.4.3.4 Potential of occupational injuries

The safety of nurses may be compromised by handling patients and equipment with excessive weight as this makes them prone to occupational injuries. Almost a quarter of the nurses indicated that they need assistive devices to move and lift heavy patients. Some of the participants made the following statements:

“...nurses to be provided with equipment for lifting heavy patients...”, “...female nurses are made to lift up heavy patients or objects...”, “...nurses experience musculo-skeletal disorders because of high workloads...”

5.4.3.5 Violence in the workplace

Above a quarter 241 (26.0%) of the nurses indicated that they experienced workplace violence in the previous twelve months of their employment. These nurses felt that their safety has been violated by perpetrators of violent incidents. Most of the perpetrators 124 (51.4%) were patients, whose violence was directed towards nurses. A second major group of perpetrators 97 (40.2%) were the patients' family members. The participants suggested that there should be a police presence to deal with the situation or that they get allocated male counterparts who will assist in dealing with acts of ferocity. The participants also pointed out their reluctance to take care of potentially violent patients, such prisoners and those suffering from mental health. Direct responses to support this notion include:

“...provision of effective security for violent patients... we are not safe, they promise to beat us up...”, “...SAPS to control violent patients and their family members...”, “...more male nurses needed to be paired with female ones to help with aggressive patients, and heavy patients...”, “...and to avoid sending aggressive patients to wards...”, “...not willing to work with ‘dangerous patients because they are violent, like prisoners and psychiatric patients...”

Other perpetrators implicated in the acts of violence were fellow male health care staff who accounted for above a quarter of violent incidents against participants. Verbal abuse was the highest form of violence reported. Other violence reported took the form of assault, physical attacks sometimes with a weapon, provocation and ill-treatment. This is reflected in the following written statements:

“...nurses exposed to sexual harassment and exploitation...”, “...victimisation, verbal abuse by patients and male staff...”

Few participants were firm in their view that all perpetrators of any form of violence against the nurses should face some form of sanctions or discipline. This shown in their statements:

“...provide a system that will ensure punishment of abusers of nurses...”, “...some disciplinary measures for verbal and physical abuse of nurses by patients and their family members...”

5.4.3.6 Health screening

Less than a quarter 211 (22.8%) of the participants indicated that they underwent screening upon employment, whilst very few participants 76 (8.3%) underwent periodic medical assessments. During rotation from unit to unit, about 24 (2.6%) of participants reported to have been screened.

Of those who were screened upon employment, Hepatitis B was a disease against which most participants 113 (54.0%) were screened, the next major screening was against TB, which was conducted on screening 71 (33.7%) participants. Further screening was done against medical conditions and occupationally transmitted infections such as Hepatitis A and C; HIV status, and some respiratory conditions such as asthma. Pregnancy and urogenital infections were tested as well. The participants also indicated that they tested for hypertension and cardiac conditions, as well as glucose levels, arthritis and cancer. When rotating from one unit to the other few participants stated that they were screened for HIV, TB, unspecified type of hepatitis and X-rays exposure after the rotation. Others did not mention the type of screening.

The open responses pointed that the screening intervals were different for participants. Majority of participants who underwent periodic medical assessments, indicated a twelve-month interval between the assessments. Less than a quarter of the participants indicated a six-month interval, and other intervals varied from five-year; two-year; five-month; three-month; and one-month interval periods. Almost four percent of participants mentioned random screening, whilst about three percent indicated that screening was done if a situation that necessitated the screening arose. Individual written statements from the participants are:

“...last assessment was two years ago...”, “...done if there is a complaint...”

5.4.3.7 Safety inspections

About half 448 (48.4%) of the participants indicated that safety inspection were conducted in their units. It is noted that inspections of workplace safety were conducted periodically by different stakeholders within and outside the hospitals. Almost half of the inspections were conducted by the infection control nurse, whereas the OHS team conducted a third of the inspections. The quality assurance nurse, unit and hospital managers, environmental health practitioners were identified as other stakeholders responsible for conducting safety inspections. Risk managers conducted the least inspections, as indicated by 3 (0.7%) participants. Other stakeholders include professional nurses, lecturers, security, employee wellness, disaster management, waste management and officers from government. A written comment from one of the participants said:

“...people from the Regional and National office...”

5.4.4 Work-related stressors within the context of psychosocial well-being

The presentation of data cuts across the psychosocial avenue of influence and spills over to the personal health and the physical work environment. Various stressors were identified and grouped into sub-sections to provide a well synthesised narrative. The sub-sections include: (i) strenuous work engagements which include increased workloads and long hours of work; shift work and insufficient rest periods; (ii) staff factors; (iii) managerial factors; (iv) management factors; (v) work environment; and (vi) personal home-work factors.

5.4.4.1 Strenuous work engagements

Increased workloads made it difficult for more than a third 386 (41.7%) of participants to carry out meticulous and quality patient care. The participants were at times forced to work long hours to try and cover up for work that would have piled up, or even work unscheduled shifts and perform non-nursing related work. Participants reported experiences of work-related stress as a consequence of high work pressure, and the following are some of the quoted responses:

“...difficult to execute work...”, “...stay behind every day to cover work as a result of increased workloads...”, “...I am not a shift worker but end up doing shifts because of absenteeism and high workload...”, “...doing non-nursing duties...”

Long hours of work were viewed by almost a fifth 193 (20.8%) participants to be contributing towards work-related stress. It was noted that it is unacceptable for one to work twelve hours in a shift and worse still work such long hours in a consecutive three-day period. Of these participants 151(38.4%) pointed out that they worked 40-hours in a week, while 89 (22.7%) indicated that they worked between 41 and 50 hours a week, and about three percent stated more than 50 hours per week. In some instances, the total number of working hours differed per week, while in others the hours depended on absenteeism. Few nurses also reported that they work for less than 40-hours in a week. The individual statements from participants were captured as follows:

“...12 hours too long for one shift...”, “...day shift has long work hours...”, “...not working normal 40 hours...”, “...12-hour shift unacceptable...”, “...3-days and above, consecutive work without a break...”, “...long hours of work without enough rest between the 12-hour consecutive shifts...”, “...working the whole weekend is strenuous...”

A third 300 (32.4%) of the participants pointed that engaging in shift work was a work-related stressor, with few highlighting day-shift as being more strenuous than other shifts. Almost a quarter of these participants revealed their dissatisfaction with working night, holiday and weekend shifts. The following are some of the statements that were made by the participants with regard to shift work:

“...day shift is stressful because of less or no tea and lunch breaks...”, “...shift work is stressful and strenuous...”, “...impossible to sleep during the day...”

The responses written by a nurses concerning night, holiday and weekend shift are that:

“...weekend and holiday shifts stress a lot...”, “...night shift is stressful, working 12-hour shifts 7 days in succession...”, “...working weekends, night and holidays disturbs family life...”, “...it affects my productivity...”, “...mind always tired during night duty...”

On the contrary, one respondent stated that:

“...there has to be 24-hour coverage, patient care has to be rendered...”

Less than a quarter 197 (21.3%) of the participants experienced insufficient rest periods which they attributed long shifts and poorly structured duty schedules by managers. Few of the participants highlighted that insufficient rest periods were also resulting from lack of provision of rest areas. This was branded a stress factor, especially during night shift, and this led to experiences of extreme tiredness. The following were written statements proclaimed by the nurses:

“...no rest breaks due to management demands and increased workload...”,
“...day shift does not have enough rest periods...”, “...no provision made for rest rooms...”, “...no rest area for night duty...”

5.4.4.2 Staff factors

Some factors among staff were seen as causal factors of stress in the workplace. Six hundred and twenty-five participants indicated that they experienced work stressors, and of these, 128 (20.5%) attributed the stress to staff factors. The nurses felt that they were taken advantage of and made to work hard whilst professional nurses did less work, which gave rise to feelings of demotivation at work. The other staff factors include lateness, absenteeism and a general shortage of staff. Matters were further exacerbated by issues related to verbal abuse by fellow staff members, particularly medical staff. About one quarter of the participants noted that working relationships were poor and even raised their concerns about the attitudes of some of their colleagues.

Few participants reported other stress causing factors among nurses as insubordination and uncooperative support staff. The participants corroborate their claims of demotivation, laziness and abuse in their statements that:

“...professional nurses don't do their work, they sit...”, “...students being used to fill in the shortage gap”, “... lack of motivation to work...”, “...stressed staff members see no need to team work...”, “...not enough staff to work in a shift...”, “...verbal abuse by medical staff...”, “... attitudes of colleagues and poor working relations...”

Some pointed out that the cases of staff who reported late for work and caused stress in others were not properly reported on, and this made overlapping of shifts a misnomer. Most of the participants cited of ill-health and feeling too exhausted to report for duty as reasons for absenteeism, and said nurses were overwhelmed with work. The participants' statements include:

“...absenteeism of staff due to ill-health and exhaustion resulting from overwork...”, “...staff come late to relieve others...”, “...next shift report late for work...”, “...no overlap of staff between shifts for report giving...”

Some participants viewed the unplanned movement of staff to relieve shortage in other units after other staff members had not reported for duty, or in response to a general shortage, as stressful. One nurse mentioned that:

“...being moved to work in other wards because staff is either absent or not enough...”

The other staff factor is that although patient care delivery depended on the availability of goods and materials, and hospital support staff, those who were responsible for such duties were viewed as irresponsible, unsupportive and lacking discipline with regard to the delivery of goods and material required by nurses to do their work. The following quotes are instructive:

“...attitude of reluctance by support staff to deliver materials and goods...”, “...hospital support staff are ill-disciplined...”

5.4.4.3 Management factors

The participants who cited issues within the realm of management were above a quarter 297 (32.1%), and they perceived this as impacting untowardly on their psychosocial well-

being with regard to the occupational health and safety (OHS) for nurses. Some of the issues that were raised pertained to management practices and their lack of compassion for nurses, failure to provide the needed resources and non-implementation of services. The responses were grouped into lack of intervention, lack of caring, lack of resources and inappropriate workload and placement for female nurses.

Majority of nurses viewed poor management practices as causing work-related stress among the nurses. In addition, the lack of support and unrealistic demands from management were cited as leading to stress among nurses. The following statements underline the nurses' views here:

"...unreasonable demands from management...", "...lack of managerial support and supervision...", "...lack of appreciation by management...", "...management failed to deal with raised issues, they don't care...", "...unapproachable managers disorganise work environment and cause psychological stress...", "...verbally abusive managers who abuse their power, they tell us 'voetsek' out of the office..."

The nurses also made the following statement with regard to poor management practices and poor planning:

"...forced to work night shift at a time you can't...", "...poor allocation and poor planning of shifts work by management...", "...being denied annual leave off...", "...too many policies from National to be implemented...", "...opportunity for growth denied...", "...staff allocation is unfair and biased...", "...no budget for implementation of new ventures..."

Other participants pointed to the structure of duty schedules as contributing to their experiences of stress, as noted in the following statements:

"...wrong structure of duty schedules...they are strenuous and inflexible...", "...haphazard work hours...", "...working more than three days without a rest in day duty...", "...day and night duty mixed in one week...", "...abnormal duty roster..."

5.4.4.3.1 *Lack of intervention and implementation*

Of the participants who cried foul of management, few of them pointed out that managers did not intervene to solve issues pertaining to the delivery of care, and in some instances managers were reluctant to solve matters. Some pointed out that managers only intervened when they felt pressured to do so. These are some of the statements which they uttered:

“...human and material shortages not resolved...”, “...logistical, technical and mechanical problems not sorted by management...”, “...failure and reluctance by management to solve problems... poor management skills...”, “...you are supported by management only if you complain...”

Managers failed to intervene in the problems of logistical and technical nature, while many participants also indicated that there has been no intervention with regard to provision of safety in the workplace. The following statements were made by the participants:

“...no safety measures in place for HCWs...”, “...no programmes in place to enhance safety, OHS does not exist...”, “...health and safety of nurses in health care industry is non-existent...”

Managers still lacked intervention skills even after receiving advice and suggestions made by the occupational health nurse with regard to issues of health and safety for nurses. One respondent mentioned that:

“...findings of OHS nurse not acted upon by management...”

The lack of implementation of OHS policy stipulations resulted in the failure to promote the health and safety of HCWs. Individual participants made the following statements:

“...no periodic safety inspections...”, “...no periodic health assessments of workers in the hospital...”

5.4.4.3.2 *Lack of caring*

Many participants were of the view that management lacked compassion for nurses, failing to provide support to the nurses and not considerate of matters affecting their well-being in the workplace. It was noted that the management's non-caring attitudes were shown in their conduct and the way they spoke to the nurses. Some participants felt that they were at times left to fight for survival without the support of management. The following are some of the written statements that came from the nurses:

"...no support by management to HCWs...", "...very poor consideration of the health and safety of HCWs...", "...protect yourself at your own discretion to survive...", "...health and safety of workers compromised due to neglect by management, no one cares...", "...managers come only when there is a problem concerning patients to scold at nurses and find mistakes...", "...female nurses treated as males...", "...health and safety of nurses not considered... as long as nurses provide a service to patients...", "...if sick or admitted, you are on your own...", "...managers aggressive and authoritative...workers told to leave if they can't take it, there are people looking for jobs..."

5.4.4.3.3 *Lack of resources*

About a fifth of the participants felt that the lack of resources compromised their safety. They pointed out that they sometimes had to render patient care without certain protective equipment and basic infection control material. The individual responses from nurses regarding the lack of resources were:

"...no hand wash consumables...", "...no provision for personal protective equipment (PPE)...", "...no proper working equipment is provided...", "...provision of correct PPE and proper hand washing material to be offered to workers..."

5.4.4.3.4 *Personal health services*

Personal health services in the workplace were not offered to the nurses. Many nurses indicated that they had to seek health services outside their workplaces and were even not offered extra time to consult outside their hospitals. They pleaded for basic personal health services so that they could undergo necessary screening tests for breast and

cervical cancers and receive services for family planning. The following statements underline their views:

“...no family planning services for staff provided, and no time to go to outside health care services...”, “...nurses to be able to consult inside the hospital, and not outside at private health facilities...”, “...management does not provide proper occupational health services to sick nurses...”

No room for growth, was a condition which impacted on the emotions and psychological well-being of few participants. As a result, the nurses indicated that there was a need for debriefing sessions, where they could share their problems and challenges with others. Few participants indicated that they worked hard and deserved some respect. The participants pointed out the following:

“...need for debriefing sessions, nurses are stressed emotionally and physically...”, “...no opportunities for growth provided...”, “...nurses working under difficult circumstances and not given the respect they deserve...”, “...overworked and underpaid...”

A minority of nurses 71 (7.7%) pointed out that the social well-being of nurses was not considered as evidenced by the lack the provision of facilities such as a staff crèche for their children. They underscored that management was insensitive to the dangers they face when travelling to work, and even suggested that transportation services be made available for them. One nurse even felt that nurses were disregarded. The following statements were shared:

“...no provision for day care facilities for children of staff...”, “...travelling to/from shift work in the night is dangerous and transport should be provided...we are victims of rape...”, “...psychosocial needs of nurses are ignored...my social life is completely shattered...”

5.4.4.3.5 Inappropriate placement of pregnant and other sick nurses

A major portion of the participants considered the placement of nurses, especially pregnant ones in wards with a high workload or with potential to violence as highly unacceptable. They were of the view that management should allocate pregnant nurses

to wards with light duty and not expose them to hazardous biological agents (HBAs) in medical wards nor to violent patients in psychiatric units.

“...exposure of pregnant and breast-feeding nurses to medical wards puts them at risk of contracting diseases...”, “...pregnant workers assigned to work in medical wards by management...”, “...pregnant nurses made to work long hours and lift heavy patients...”, “...pregnant HCWs made to work in hazardous wards...”, “...staff allocation does not consider the health issues of nurses, miscarriages occur to female employees...”, “...pregnant nurses made to work in strenuous wards with a risk of miscarriages...”, “...pregnant nurses to be allocated to wards with light duties...”, “...all nurses in their child-bearing age, not to work in high risk areas...”

Few participants also complained about the placement of nurses with medical diagnoses in wards that were likely to aggravate their conditions. Their views are as follows and these were their statements:

“...nurses with depression not to be assigned to psychiatric wards...”, “...nurses with serious medical conditions not to be assigned to medical wards, and to be assisted...”, “...consideration of older workers and their vulnerability to illnesses...”

5.4.4.4 *Personal home-work factors*

Lack of balance between home-and-work issues was highlighted as a stress causing element by about a fifth of the participants. They indicated a number of issues from work, such as working long hours and shifts, travelling to work during the dark hours and being too tired to focus on their families, which impacted on their home-life and brought instability in their family lives. The participants' direct statements were captured as follows:

“...home-work interface a problem because of a 12-hour shift...”, “...not spending enough time to see the family...”, “...travelling to/from work in the dark...”, “...family/ children neglected after hours, weekend and night duty...”, “...difficult to balance or plan personal schedules...”, “...no quality time with family because of stressful shift work...”, “...neglect of family and family issues...”, “...no energy to focus on personal/ family demands and work accuracy...”. “...no time to attend to

personal/ social issues and be with family...”, “...dangerous to travel late to/ from work, too stressful...”, “...stressing about break-ins to your home...”

5.4.4.5 Patient factors

Patients and their families were depicted as contributing to work-related stress because of their unappreciative nature and the demands they put on the many of the participants. Incidences of abuse also exacerbated the situation. The participants’ statements read thus:

“...Verbal abuse by family/community...”, “...verbal abuse by patients...”, “...unreasonable demands from patients...”, “...patients not appreciative...”, “...uncooperative patients and relatives...”, “...aggressive patients who physically assault us...”

Nevertheless, few participants pointed out that they became stressed due to client turnover, increased patient mortality, the management of psychiatric patients, and dealing with defaulters as well as mental health users. The following statements are instructive:

“...client turnover from other facilities closed for renovations for two years...foreigners, not going to the clinic...”, “...placing psychiatric patients in non-psychiatric wards with nurses who do not have the skill to handle them...”, admission of defaulters and psychiatric patients...”

5.4.4.6 Work environment

Almost above a quarter of the nurses viewed their work environment as a stressor, with some referring to it as unpleasant. A number of issues were attributed to the stressful work environment and these include inadequate equipment and non-functioning machinery. The other stress triggering factors that were highlighted by the participants are a lack of facilities and the dangers within the environment. These analytic observations are confirmed in the following participants’ statements:

“...broken machines, having to use other hospitals’ machines...”, “...lifts not working we have to carry patients ourselves from one floor to another...”, “...shortage of equipment and stock...”, “...unpleasant work environment...”, “...workplace violence...”, “...politics, cultural and racial barriers...”, “...no nursery in hospital for staff kids...”, “...no allowance for working with hazardous biological agents (HBAs)...”

The majority were expecting a safe working environment from their employer. Their view is that a safe environment, characterised by little or no threats to the HCWs conditions, good hygiene and a proper management of medical waste, enables them to render quality patient care. Some the participants mentioned that:

“...working environment be improved so that HCWs can be safe at work...”,
“...better waste management measures...”

5.4.5 Addressing the OHS challenges and needs of nurses to promote a good work life

The data analysis of the participants’ open-responses on the occupational health and safety needs of nurses by yielded responses which were categorised and discussed under the following categories: improve health measures, involve nurses in OHS related decisions, address workload issues and improve safety measures.

5.4.5.1 Improving health measures

5.4.5.1.1 Wellness and support

The majority of the participants were of the opinion that management should provide OHS services to enhance the nurses’ well-being. They also thought that they needed acknowledgement and support from their managers. The nurses indicated further the need for OHS rules and guidelines to be developed and made known to all HCWs. Some were of the view that they should leave the employ of public hospitals owing to the management’s lack of appreciation and disregard. Some of their responses include:

“...management to communicate and provide support and feedback on health and safety issues...”, “...policies and programmes on health and safety to be in place and communicated...”, “...staff needs to be considered, respected and acknowledged, “dissatisfied.....need to leave the public sector...”, “...prolong maternity leave...”, “...managers to stop being authoritative and bullying, and to do their work, regular safety inspections...”

On the contrary there were very few participants who felt positive about OHS services in their workplaces, and indicated that all is well regarding the provision of health services for nurses and in ensuring their safety. These positive comments stated that:

“...safety in hospitals is currently well addressed...”, “...no need for improvement, everything is fine...”, “...women are safe in the health care industry... they know how to handle hazards...”

5.4.5.1.2 Education and training

Many of the participants considered the provision of education and training, on matters affecting health and safety of nurses, to different stakeholders as something significant. The Nurses themselves were of the view that they needed training on matters affecting their health and safety at work. They also pointed out that it was very important to educate the community on issues related to the safety for nurses. The following are some their responses:

“...physiotherapists to teach nurses the lifting technique to avoid hurting the back...”, “...educate the community through media and pamphlets about hardships that HCWs are going through, and the community’s bad behaviour towards HCWs...”, “...give health talks, workshops to nurses regarding matters affecting women...”, “...educate male counterparts and male doctors about negative attitudes towards female nurses...”

Some nurses suggested that training should be geared towards personal growth and development and as such they demanded that they should be given skills to develop and provide better patient care. Finally, one nurse made the following statement:

“...opportunities for growth be provided, and nurses provided with skills to care for psychiatric patients...”

5.4.5.1.3 *Medical surveillance*

Most participants underscored the need for medical assessment at work. They also pointed out that the nature of the medical assessment should be comprehensive enough to cover both their physical and psychosocial conditions. Furthermore, they expected that the assessment intervals be done as per the requirements of OHS legislation. Some of the participants made the following statements:

“...continuous assessments of health status of HCWs including emotional, physical and spiritual health, together with debriefing sessions...”, “...medical surveillance on appointment, and thereafter periodically...”

5.4.5.1.4 *Resources and services*

Less than a quarter of the participants were of the view that relevant resources should be made available in order to address the health and safety needs of nurses. These include family planning service; services to enhance fitness and team building; the provision of personal comfort such as rest rooms, ablution facilities and those for recreation, as well as the provision of staff transportation and staff accommodation. Some of the participants, comments are that:

“...nurses to be offered privileges of proper screening for female-related illnesses, including PAP-smears and mammograms...”, “...family planning services and health screening services for staff to be provided...”, “...provision of wellness clinic for staff, fitness training programmes, and support groups for nurses...”, “...provision of recreational and child facilities, staff accommodation, rest rooms during lunch and night duty, ablution facilities...we share toilets with patients...”, “...team building, gym sessions and debriefing needed for nurses...”, “...provide transport at night to/from work...”

5.4.5.2 Involving nurses in OHS related decisions

5.4.5.2.1 Input and feedback

Above a quarter of the nurses wanted the relevant stakeholders to involve them in matters of OHS that affect them. They felt they needed to make inputs where it mattered. Others indicated that the National and other offices should consult them and not impose their decisions on them. The participants considered worker unions as a third party that could speak on their behalf. These are the participants' views with regard to input and feedback:

“...nurses to be involved in decision making...”, “...suggestion boxes, Nurses’ Indaba for them to air their views. “Nurses need to be listened to...we must write a letter to the MEC and Minister of Health...”, “...National and Provincial Government to be knowledgeable the impact of new programmes before implementing them...”, “...involve the unions or any 3rd party to help solve nurses’ work issues...”

5.4.5.3 Addressing workload issues

5.4.5.3.1 Placements

Most participants were concerned with the allocation of duties, especially to those who are pregnant, those with medical illnesses or the elderly. They were of the view that these nurses should not be placed in units that have a heavy workload, medical hazards and psychiatric patients. The participants also pointed out there is need to determine the type and duration of shift that can be made available to pregnant nurses. A minority group felt that one should be allowed to pick where they want to be placed, with the allocation of night shift being open to those who like to work night duty. The statements made by the participants regarding placement were:

“...all pregnant and sick nurses to be placed in less stressful jobs and not to do night duty...”, “...pregnant and breast-feeding workers to do 8-hour shift and not 12-hour shift...”, “...females not to work in male psychiatric wards...”, “...people to be allowed to choose area of work preference...”, “...allocation to different wards must consider the health problems of nurses...”, “...age consideration for heavy work...”

5.4.5.3.2 *Hours of work*

Work hours were one of the huge concerns for many nurses, as some indicated, in their responses that, the long hours of work were a problem area that needed to be addressed. They showed unhappiness with the long hours worked per shift and the poor structuring of as well as inflexibility with regard to shifts. Some of the comments regarding hours of work are that:

“...reduce long hours and provide normal working hours...”, “...well-structured shifts, flexible work schedules...”

5.4.5.3.3 *Staffing*

High workloads were attributed to insufficient staff by many of the participants, and they also wanted staffing issues to be attended to. They also suggested that a plan for staffing and funding from the government be established, as noted here in some of their comments:

“...hire more staff to reduce workloads...”, “...proper planning of staff and budget by National and Provincial Government...”

5.4.5.4 *Improving safety measures*

5.4.5.4.1 *Equipment and material*

Almost below a quarter of the nurses expected management to procure good functioning machines and assistive devices to help them move or carry heavy patients as these would limit the number of or even result in no injuries. The participants also suggested that infection control consumables be supplied to minimise hazardous agents. The following are some of the participants' statements on this matter:

“...procurement of good quality equipment...”, “...provision of PPE, and proper hand washing procedure and resources...”, “...modernised beds or patient lifting apparatus...”

5.5 RESULTS ON INSPECTION REGARDING THE AVAILABILITY OF AND COMPLIANCE WITH THE OHS POLICY (PART A)

The data presented in this section is drawn from a review of occupational health and safety (OHS) documents of participating hospitals regarding the availability of the OHS policy and compliance thereof. The document review involved a verification, by the researcher, of whether the documents were available or not. Eight hospitals participated in the study and the response rate was 100%.

5.5.1 Availability, implementation and compliance with the OHS policy

The key findings, as presented in table 5.24, are that 6 (75.0%) hospitals had an OHS policy, which the researcher witnessed herself. Among the hospitals that had an OHS policy, 2 (33.3%), had is visibly displayed for workers to see. All 8 (100.0%) hospitals were compliant with the OHS Act 85 of 1993 as amended in that they had OHS committees and safety representatives, as noted, by the researcher, from minutes of meetings held and the names of committee members.

Table 5.24 Summary of findings regarding the availability, compliance and implementation of OHS policy (n=8)

Variable	n	%
Does the institution have an internal policy on occupational health and safety?		
Yes	6	75.0
No	2	25.0
Total	8	100.0
Is the policy visibly displayed for employees to see? (If answer to A4 above is Yes) (n=6)		
Yes	2	33.3
No	3	50.0
No response	1	16.7
Total	6	100.0
Is the policy communicated to employees? (If the answer to A4 above is Yes) (n=6)		
Yes	6	100.0
No	0	0.0
Total	6	100.0

Variable	n	%
Does the institution have the services of an OHS nurse?		
Yes	8	100.0
No	0	0.0
Total	8	100.0
Is there a health and safety committee in the institution?		
Yes	8	100.0
No	0	0.0
Total	8	100.0
Are there health and safety representatives in the institution?		
Yes	8	100.0
No	0	0.0
Total	8	100.0
Is training provided for the OHS representatives?		
Yes	8	100.0
No	0	0.0
Total	8	100.0
Are nurses given safety training?		
Yes	6	75.0
No	2	25.0
Total	8	100.0
Are risk assessments conducted in the institution?		
Yes	8	100.0
No	0	0.0
Total	8	100.0
If the answer to is Yes, how long ago was the assessment done? (presented in months)		
1-3	1	12.5
4-6	1	12.5
7-9	1	12.5
10-12	0	0.0
13 and above	3	37.5
Not known	1	12.5
Unspecified	1	12.5
Total	8	100.0
Are there any inspections that are done in the institution?		
Yes	7	87.5
No	0	0.0
No response	1	12.5
Total	8	100.0
If the answer to A13 is Yes, how long ago was the inspection done? (presented in days)		
1-3	6	75.0
4-6	0	0.0
7-9	0	0.0
10-12	0	0.0
13 and above	0	0.0
Not known	1	12.5
Unspecified	1	12.5

Variable	n	%
Total	8	100.0
Are there any safety signs and /or posters displayed around the hospital?		
Yes	7	87.5
No	1	12.5
Total	8	100.0

5.5.2 Responses regarding training and information dissemination

‘Yes’ or ‘No’ responses were required for the items on training and information dissemination in the checklist.

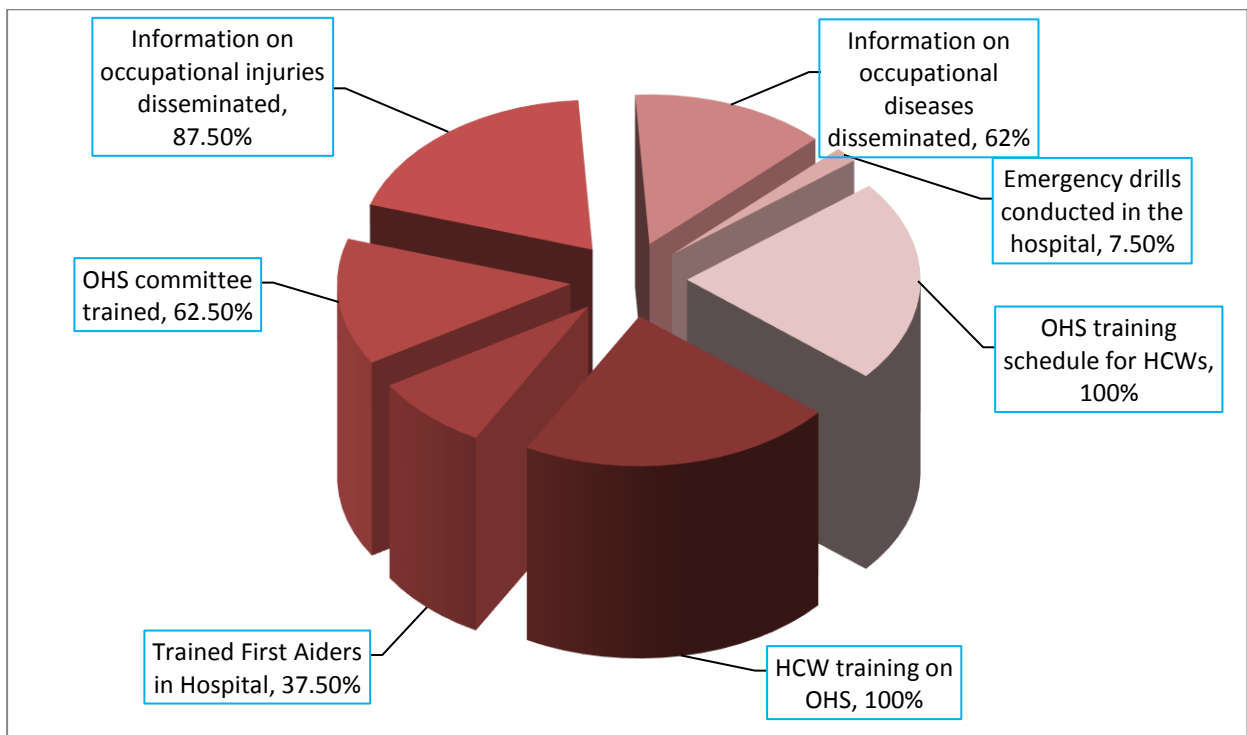


Figure 5.13 Hospitals' responses based on training and information dissemination (n=8)

The analysis revealed that 8 (100.0%) hospitals trained their workers on OHS matters. In addition, a schedule existed for such training, with 3 (37.5%) hospitals having conducted emergency drills as illustrated in figure 5.13 above.

5.5.3 Medical surveillance

‘Yes’ or ‘No’ responses were required for the items on medical surveillance in the checklist.

5.5.3.1 Diseases for which employees are periodically vaccinated

The data analysis reveals that 8 (100.0%) hospitals vaccinated their workers for hepatitis B periodically. Further details about employee vaccinations are shown in figure 5.14 below.

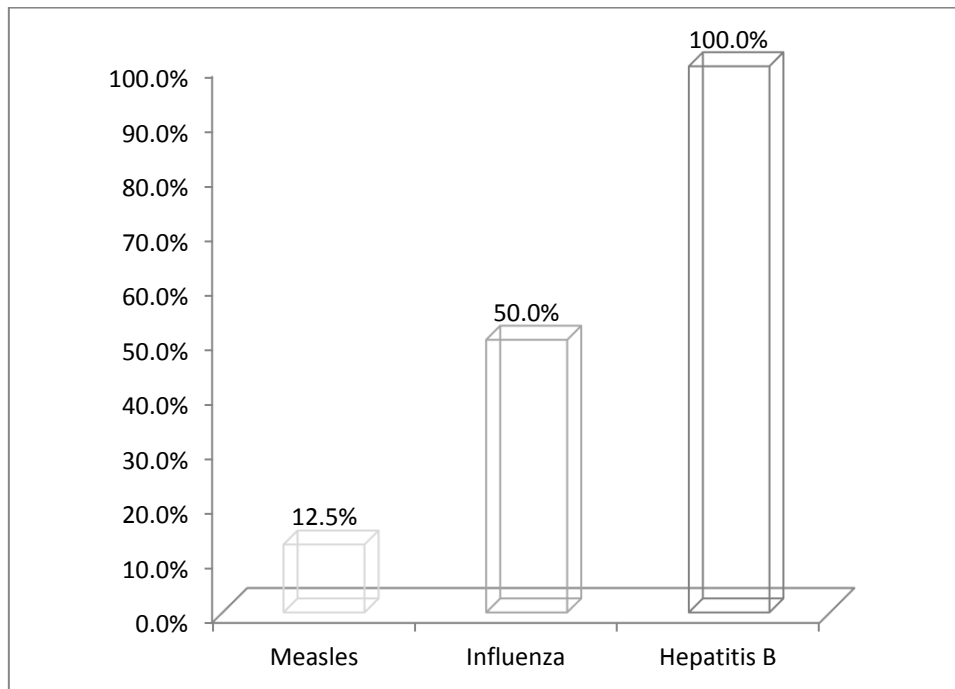


Figure 5.14 Diseases for which HCWs were periodically vaccinated (n=8)

The responses from all participating hospitals, indicate that none 0 (0.00%) of the hospitals vaccinated their workers against tuberculosis, rubella and pertussis. Nevertheless, all 8 (100.00%) hospitals provided periodic vaccination against hepatitis B, with 1 (12.50%) providing vaccination for measles, and 4 (50.00%) for influenza, as indicated in figure 5.14.

Table 5.25 Summary of responses based on medical surveillance (n=8)

Variable	n	%
Have all health care employees undergone pre-employment medical examination?		
Yes	0	0.0
No	8	100.0
Total	8	100.0
Is there a periodical screening of health care workers for hepatitis B?	6	75.0
Yes	2	25.0
No	8	100.0
Total		
Is there a periodical screening of health care workers for hepatitis C?	1	12.5
Yes	6	75.0
No	1	12.5
No response	8	100.0
Total		
Is there a periodical screening of health care workers for Tuberculosis?		
Yes	7	87.5
No	0	0.0
No response	1	12.5
Total	8	100.0
Are pregnant employees reassigned to other duties temporarily?	2	25.0
Yes	5	62.5
No	1	12.5
No response	8	100.0
Total		
Are there any warning signs or placards displayed in danger areas?	6	75.0
Yes	2	25.0
No	8	100.0
Total		

5.6 PRESENTATION OF DATA FROM INSPECTION CONDUCTED TO ASSESS THE EXISTENCE AND COMPLIANCE WITH THE OHS POLICY (PART A)

5.6.1 Health promotion in the context of policies, systems and procedures

The participants pointed out that health promotion or lack of it, is a major factor that impacts on the management, environment, staff and policy of hospitals.

5.6.1.1 Managerial factors

Many participants were of the view that management is unsupportive and uninvolved in occupational health promotion. This is evidenced in the poor managerial practices and the fact that no budget was allocated to assist OHS promotion. Some of the statements that were made by individual participants to support their claims are:

“...uninformed managers with unpleasant attitudes...”, “...lack of management support...”, “...poor emphasis on the use of PPE...”, “...lack of role integration and poor reporting system...”, “...no transparency...”

The participants also noted that managers were inconsiderate of the pregnant workers' conditions. The view corroborated by the following statements:

“...re-allocation of pregnant employees only if they have reported or are having complications...”, “...no written standard operating procedures for pregnant employees...”, “...discretion lies with the operational manager in the unit...”

5.6.1.2 Staff factors

A major portion of the participants pointed out that staff members were not playing their part and thus not committed towards the promotion of occupational health and safety. It was underscored that some hospital general workers contributed to this situation, as noted in the following statements:

“...resistance from general workers...”, “...non-compliance with safety signs, rules, universal precautions...”, “...poor staff attendance of meetings and training...”, “...lack of commitment...”

5.6.1.3 Environmental issues

The work environment was considered as not conducive to the enhancing of the HCWs' health and safety by above a quarter of participants. Certain groundwork aspects, such as loose floor tiles, were perceived to be of poor design and lacked maintenance. The

factors contributing to this poor design and state of disrepair include under-resourcing, as noted in the following responses:

“...poor infrastructure...”, “...poor maintenance of infrastructure...”, “...poor design...”, “...lack of resources...”

5.6.1.4 Policies and programmes for health and safety promotion

The notion of having policies and programmes in place to give support to, and protect the well-being of pregnant health care workers and the elderly ones, was expressed by many nurses. This opinion is expressed in the following statements:

“...health risk assessments focusing on pregnant employees...”, “...full implementation of medical surveillance programme focusing on pregnant employees and elderly nurses...”, “...health and safety policy for pregnant women...”, “...no night allocation for pregnant employees...”, “...flexi-hours and re-assigning light duty for pregnant women...”

It was also noted that budget reserves were required to set-up new programmes and functional OHS centres which should be fully resourced with equipment and staff. The following statements validate this finding:

“...budget allocation to OHS programmes...”, “...provision of staff to implement OHS...”, “...allocation of OHS doctor...”, “...fully functional wellness staff and clinic...”

The findings also indicated that there is a problem with regard to the existence of programmes which were however not adequately implemented. The following response underscores this issue of non-implementation of existing programmes:

“...non-implementation of existing programmes...”

5.7 DESCRIPTION OF OHS INJURIES AND DISEASES DATA FROM REVIEWED HOSPITAL RECORDS (PART B)

5.7.1 Nature of occupational diseases

5.7.1.1 Occurrence of occupational TB in the period 2011-2014

A total of 26 nurses from all the participating hospitals (H1-H8), with a mean value of 3.25, were reported to have contracted TB at work in the last three years. A maximum of 10 (38.4%) nurses with TB were reported in hospital eight (H8) and a minimum value of 0 (0.0%) was reported in hospital six (H6). Hospital 5 (H5) had the second highest cases at 6 (23.0%) followed by 4 (15.34%) in H7. Three nurses (11.5%) were reported in H3, whilst H1, H2 and H4 had 1 (3.9%) reported case each. The figure 5.15, below shows this data in a diagrammatic form.

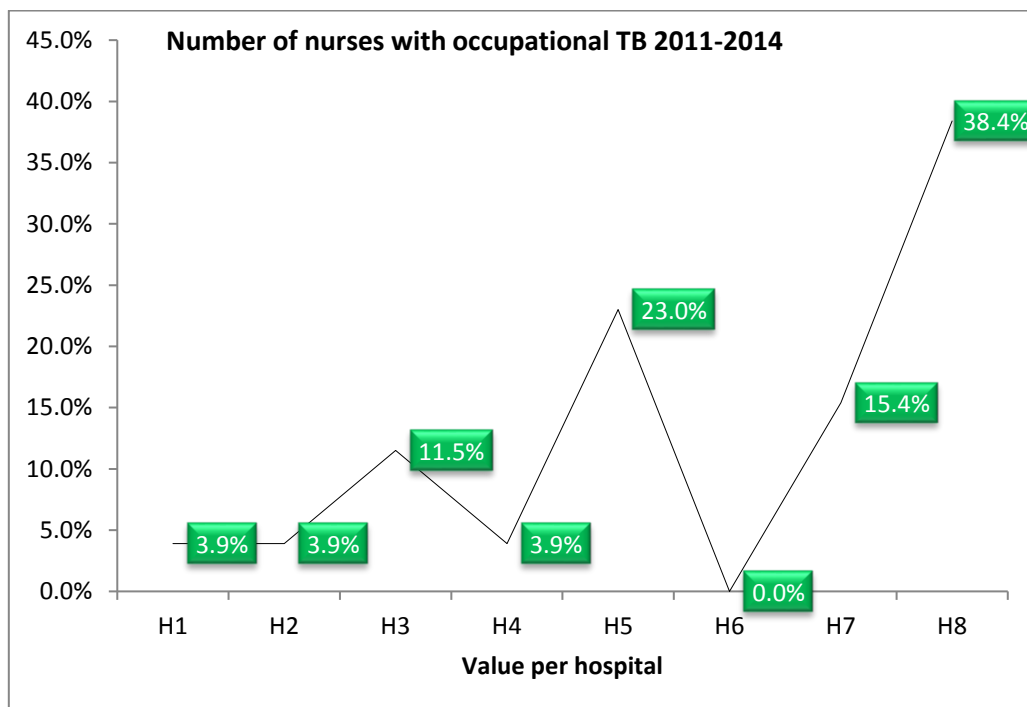


Figure 5.15 Number of nurses with occupational TB in the 8 hospitals during the period 2011-2014

5.7.1.2 Summary of occupational disease occurrence in all hospitals during the period 2011-2014

The data reported in this section pertain to the reviewed for the period 2011-2014. The analysis reveals that no cases of MDR-TB among nurses were reported in 7 (87.5%) hospitals, whilst 1 (12.5%) hospital reported a single case of occupational MDR-TB for the period 2011-2014. All hospitals 8 (100.0%) reported no cases of XDR-TB among nurses, and 7 (87.50%) hospitals had no case of medical boarding, resulting from TB and related complications, among nurses. The analysis shows that no nurse died of TB, MDR-TB and XDR-TB in the period 2011-2014 in 6 (75.0%) of the participating hospitals. All 8 (100.0%) hospitals, however, reported incidents of accidental exposure to blood HBAs through needle stick injuries in the period 2011-2014 among nurses. A total of 6 (75.0%) hospitals reported accidental exposure to body fluids other than blood, but these however did not result in HIV infection among nurses during the period 2011-2014.

5.7.2 Types of occupational injuries in all hospitals during the period 2011-2014

The data presented in table 5.26 demonstrates that sixty-seven (67) cases of work-related musculoskeletal disorders (MSDs) were reported across all hospitals for the three-year period 2011-2014. Two (25.0%) hospitals reported that the lifting of heavy patients is the leading cause of MSDs among nurses. A total of sixty-two (62) nurses with occupational MSDs were reported to the Compensation for Occupational Injuries and Diseases Commissioner by 7 (87.5%) hospitals. Of the seven hospitals, hospital 8 (H8) reported the highest number of cases, 33 (53.2%), followed by H7 with 15 (24.2%) cases, as presented in table 5.26. In addition, 7 (87.5%) hospitals did not report any nurses that were boarded off due to ill-health related to MSDs in the period 2011-2014. Finally, a review from 6 (75.0%) hospitals indicates that no nurses were compensated for occupational MSDs in the period 2011-2014.

Table 5.26 Distribution of occupational injuries in study sites (2011-2014)

Variable	n	%
Record of nurses with MSDs reported over a three year period 2011-2014 (per hospital)		
H1	3	4.5
H2	2	3.0
H3	7	10.5
H4	4	6.0
H5	8	11.9
H6	0	0.0
H7	10	14.9
H8	33	49.2
Total	67	100.0
Factors related to the causes of MSDs among nurses in the three year period 2011-2014 in all hospitals (n=8)		
Lifting heavy patients	2	25.0
Bending related activities	0	0.0
Type of unit	0	0.0
Long periods of standing	0	0.0
Other	1	12.5
No response	5	62.5
Total	8	100.0
Nurses with MSDs reported to COIDA in the three-year period 2011-2014 (per hospital)		
H1	0	0.0
H2	2	3.2
H3	3	4.8
H4	1	1.6
H5	8	13.0
H6	0	0.0
H7	15	24.2
H8	33	53.2
Total	62	100.0
Hospitals that reported cases of MSDs to COIDA in the past three years 2011-2014 (n=8)		
Yes	7	87.5
No	0	0.0
Missing	1	12.5
Total	8	100.0

Key: H1-Hospital 1; H2-hospital 2; H3-hospital 3; H4-hospital 4; H5-hospital 5; H6-hospital 6; H7-hospital 7; H8-hospital 8 *Coding for hospitals not in any order or category

5.7.3 Findings from a review of records on occupational injuries and diseases (2011-2014)

This section presents data on occupational injuries and diseases from 2011-2014. The data in table 5.27 presents a pattern of occurrence of occupational diseases, injuries and their sources among HCWs, as obtained from OHS registers across all participating hospitals.

Table 5.27 Distribution of occupational injuries and diseases from records reviewed (2011-2014)

Type of injury/disease	2011	2012	2013	2014	TOTAL	%
Needle stick injury	47	88	105	35	275	54.6
Slips, trips and falls (STF)	12	10	39	6	67	13.3
Splash by blood or other body fluids	7	20	27	3	57	11.3
MSDs (back injuries)	3	6	10	3	22	4.4
Soft tissue injuries	4	3	7	7	21	4.2
Assault by patient	3	6	5	4	18	3.6
PTB	4	2	8	3	17	3.4
Allergy	1	--	6	1	8	1.6
Chicken Pox	--	--	1	6	7	1.4
Burns	--	1	1	1	3	0.6
MVA	1	1	--	1	3	0.6
Human bite	1	1	1	--	3	0.6
MTB	--	--	1	--	1	0.2
MDR TB	--	--	1	--	1	0.2
TOTAL					503	100.0
KEY: PTB Pulmonary Tuberculosis MTB Miliary Tuberculosis MDR Multi drug resistant TB MVA Motor vehicle accident MSDs Musculoskeletal disorders/injuries						

5.8 DISCUSSION ON FINDINGS

The discussion on the results is a blend of all three data tools used in the research for data collection. It also considers whether the information from the different tools supports or disputes each other.

5.8.1 Participants' demographic profile

The study, conducted among nurses, had the largest age distribution ranging from 40-49 years. This information is not very different from Mosendane, Kew, Osih and Mahomed (2012:154) whose mean age, in a sample of HCWs consisting of both genders, was 40 years.

All nursing categories were included in the current study. This is unlike Eljedi's (2015:33) study which focused on the occupational hazards affecting student nurses. The current study's racial groups, Blacks, Coloureds, Whites and Indians, formed part of the study, with Blacks constituting the bulk of the participants in a way similar to Zungu's (2012:489) study on HCWs in a SA public hospital, but unlike that of Mosendane et al (2012:154), which also studied occupational infections but had African South African participants only. Finally, a comparison of all categories shows that professional nurses constituted the largest group of participants.

The study's nurses worked in a mix of eight hospitals ranging from district, regional to central (representing tertiary and academic hospitals). A majority of the nurses came from district hospitals, which could perhaps be explained by the fact that district is represented by five hospitals compared to one regional and two central hospitals. This finding contrasts with the study by Assiri, Hathout, Anwar, Dalatony and Abdel Kader (2013:[2]) and Mosendane et al (2012:154) who used one level of hospital to study occupational infections among HCWs nurses of both genders. A furthermore contrast is that the study by Assiri et al (2013:[2]) includes physicians, technicians and housekeepers.

All hospital units were invited to participate in the current study but a majority of the participants came from surgical units. Most participants had 1-3 years of experience in their units, which could be attributed to staff rotation as results have already shown that the highest age group was 40-49 years. The years of experience in the health care industry showed 0-10 years as the highest experience possessed, though this finding did not seem to be in line with the 40-49 years age group majority. The demographic characteristics were also tested for association with biological hazards in the workplace and the results are discussed below.



The demographics from the second data tool included sub-districts which many had not indicated, thus probably implying that nurses did not know the healthcare sub-districts under which they fell. One type of hospital known to be a district hospital was indicated in the responses to be a regional hospital, which might have been due to changes in the upgrading of hospitals.

Finally, the OHS departments or services were manned by qualified occupational health nurses in all participant hospitals. Assiri, et al (2013:[2]) conducted a retrospective review of OHS records for occurrence of occupational diseases and NSI, which is similar with this study. However, Assiri, et al (2013:[2]) went further than this study in that they also examined the TST conversions and follow up of reported NSI.

5.8.2 Biological hazards

5.8.2.1 Association between demographics and experiences of needle stick injury (NSI) in a twelve month period

Research results in the current study yielded a significant association between NSI and the nursing category with professional nurses being found to have more experiences of NSI compared to other nursing categories. There was no association between the type of unit and NSI in this study, which is contrary to the studies by Cho et al (2012:1030) whose study demonstrates that NSI occurred in acute areas than in the wards, and that of Kruger et al (2012:7) which demonstrates that wards had more incidents of NSI than any other unit. The current study shows further that incidents of NSI occurred as accidental self-pricks related to aggressive or uncooperative patients; incorrect sharps disposal methods; patient care procedures; mishandling of a needle; and negligence by colleagues resulting in accidental pricks.

5.8.2.2 Association between participants' demographics and their experiences regarding negligent disposal of used needles

The current study findings established a significant association between age and the experiences of negligent disposal of used needles. This is despite the fact that a majority of the participants indicated no experience with the negligent disposal of used needles. Nonetheless, the 20-29 years age group had the highest experiences of negligently

disposed needles, which could be attributed to more involvement in routine patient care as compared to older age groups, who would likely be in management positions than engaging in patient care duties.

A significant finding of the current study is that professional nurses experienced more negligent disposal of used needles than other nursing categories. The study by Lipscomb et al (2009:567) on occupational blood exposure among HCWs indicates that the negligent disposal of used needles, which resulted in sharps injuries, was strongly associated with care assistants than registered nurses, a finding which is contrary to that of the current study.

The current study found a further association between the type of unit and negligent disposal of used needles. Surgical wards were found to have the most incidences of improper disposal of used needles. The factors attributed to improper disposal were staff attitudes at the most, lack of staff training, insufficient or lack of disposal bins.

5.8.2.3 Association between participants' demographic factors and constant exposure to biological agents in a unit

The current study findings reveal that constant exposure to hazardous biological agents (HBAs) in the units was associated significantly with the nursing category. Professional nurses were identified as having the highest exposure to HBAs than any other nursing category, which could be related to the fact that they are directly and constantly in contact with the patients based on the skills and knowledge they possess. Nurse managers, on the contrary, had the least exposure probably due to their involvement in office related work than on the wards.

An association was also found to exist between type of unit and constant exposure to HBAs. The current study found out that medical units had more HBAs comparatively, and exposed staff to constant encounters with HBAs. A similar finding is reported in Karani et al (2011:464) in a South African study on exposure to blood borne pathogens among medical interns, which indicates that more exposure to HBAs was found in medical units.

5.8.2.4 Association between participants' demographic factors and accidental exposure to hazardous drugs

The current research results depicted an association between race and type of hospital and accidental exposure to hazardous drugs. Blacks had the highest incidence of accidental exposure to hazardous drugs than other races, which could be due to their proportional representation in the study. Central hospitals had more incidences of accidentally exposed to hazardous drugs than the regional and district hospitals in the current study, probably due to the fact that they were offering specialised services which require specialised drugs, making them more prone to exposure than others. Bussières, et al (2012:430) also highlight an increased exposure to hazardous drugs in a study conducted in mostly large teaching hospitals which had oncology units.

5.8.2.5 Association between participants' demographic factors and experiences of unwanted reactions from the use of latex gloves

A vast majority of the current study's participants reported no reactions to using latex gloves. However, unwanted reactions resulting from the use of latex gloves were associated with nursing category and years of experience in the health care industry. The current study findings show further that participants with less than 10 years employment in the healthcare sector, experienced latex allergy, a finding which was similar to Phaswana and Naidoo's (2013:[4]) that also reported high latex sensitisation among HCWs at the King Edward VIII Hospital in South Africa. This study found out that, among the nursing categories, professional nurses had more experiences of unwanted reactions as a result of using latex gloves. Participants in this study reported poor provision of PPE, and in the case where gloves were provided, some reported them to be of poor quality, while some participants opted to buy their own powder-free or biogel gloves. Engelbrecht, et al (2015: 25) also note that non-latex gloves were not readily available for use by HCWs when required, in a finding from a South African study on exposure to occupational diseases at three public hospitals.

5.8.3 Psychosocial stressors

The current findings indicate that the most stressful factors for participants are long hours of work and shift work, increased workloads, insufficient rest periods, staff factors, patient

factors, management factors, violence at work, lack of personal health services, and home-work imbalances. These are discussed individually below.

5.8.3.1 Increased workload

The current study findings indicate that participants were not able to work diligently and could not execute quality care to patients due to increased workloads and work pressure. Similarly, the findings from Fagerström and Vainikainen's (2014:[5]) study on increased nursing workload, found that nurses experienced lack of control of high workloads in 22 hospitals in India, while the study on Brazilian HCWs by Daud-Gallott et al (2012:[3]) similarly revealed that a high nursing workload has a negative impact on patient care outcomes.

Slightly less than half of the study's participants noted their dissatisfaction with shift work and long working hours in a week. Long working hours and shift work were attributed as leading to work-related stress, a finding that corresponds with studies by Wisetborisut et al (2014: 283) which found out that working shifts with more rest breaks to avoid long hours of work, resulted in less stress among HCWs in Thailand. In addition, the findings by Kleiner and Pavalko (2010:1467) and Stimpfel et al (2012:2501) indicate that long hours of work pose a challenge to the physical and psychological well-being of HCWs. The current study shows that working a 12-hour shift, especially in a consecutive pattern, was perceived as unacceptable, as it resulted in exhaustion and insufficient rest periods. This observation is supported by Wisetborisut et al (2014: 283) who argue that less hours in a shift produced less stress. The current study reports further that although other participants were said to be working 41-50 hours in a week and others more than 50 hours, there were participants who indicated that 40 hours in a week constitute long hours of work, which may indicate some ignorance in terms of acceptable legislated labour hours. Nevertheless, 40 hours are considered acceptable, instead it is the manner in which it was structured in shifts that made the participants experience long hours of work.

The study also found compounding factors contributing to the participants' long working hours. These include unexpected extra hours forcing one to work an extra shift due to staff absenteeism. Night shift, holiday and weekend shifts were not appreciated by

participants as they were said to affect family life, a finding that corresponds with Wong et al (2011:59) that night shift affects child rearing for female HCWs in particular.

5.8.3.2 Staff absenteeism

Staff absenteeism is indicated in this study as a stress factor among participants who had to cover for those who were absent. Absenteeism has similarly been by Khawaja, Sikander, Khawaja, Jareno and Halepota (2012:903) as a case of great concern and stress factor among HCWs in countries such as the UK, USA and Pakistan.

5.8.3.3 Poor working relations among staff

Poor relations are identified as a source of stress in the current study. These poor relations are noted as existing between participants and management, ward seniors and juniors, female colleagues, and participants due to verbal abuse by medical staff. These findings are also confirmed in a study by Bourbonnais, et al (2011:482) where nurses experienced similar challenges from co-workers.

5.8.3.4 Management practices

Poor management practices were a concern for participants in this study. A majority of the participants deemed managers as unsupportive; inconsiderate; lacking supervision and appreciation; unfair; and aggressive with poor managerial skills; made unreasonable demands on nurses; and displaying non-caring attitudes through their behaviour. Likewise, findings from a study conducted by Totman, Lewando Hundt, Wearn, Paul and Johnson (2011:68) reports that HCWs felt neglected and unsupported by their managers with regard to the challenges that the staff were faced with. Abuse of power by managers was another unimpressive practice in the current study, which at times would be coupled with hurling insults at participants.

The findings of this study further indicate that managers lacked good OHS practices. It is evident that, although there existed the advice of OHS experts within the hospital, there was poor provision of PPE and consumables for hand wash, poor safety measures and insufficient programmes in store to enhance health and safety. This is supported by OHS nurses who shared the sentiments that their OHS offices lacked resources and supportive

structures, such as implementable programmes that will enhance working life. The finding is in line with Mchunu's (2012:6) study results which reveal that health promotion in the workplace needs a supportive environment, resources and policies and programmes.

Managers were blamed for wrongly structured and inflexible duty schedules. These duty schedules were perceived by participants as unsuitable and abnormal, as some schedules had mixed day and night shifts schedules in one week, which was a stress factor for participants. Furthermore, the current study notes that managers are inconsiderate especially when allocating female nurses to male medical and psychiatric wards without regard for gender, pregnancy status, heavy workloads and HBAs, because of what participants said were unfair and biased attitudes of managers. The current study also reveals that participants with depression were assigned to psychiatric wards and those with serious medical conditions were assigned to medical wards.

5.8.4 Personal health resources

The current study reveals that lack of personal health services for participants, such as family planning services, screening services for breast and cervical cancer within their hospitals, forced staff to access outside health care services without extra time being provided for that purpose. Lack of services for debriefing and lack of opportunities for growth were considered stressful in this study. The situation is compounded further by the imbalances between work-home demands, where HCWs, would, for instance face the challenge of looking for nursery places for their children, which they felt hospitals should provide for staff children. Sinha (2012:33) makes a similar finding and argues that organisations need to foster a culture that supports a balance on home and work by providing emotional resources to help HCWs cope with balancing the roles.

5.8.5 Type of work related injuries and diseases

Slips trips and falls (STF) were the highest reported cause of occupational injuries within the 2011-2014. In addition lower back injury was the commonly diagnosed musculoskeletal disorder, a finding supported by Ndejjo et al (2015:[1]) and Tullar et al (2010:200) whose study findings confirm the prevalence of low back pain among nurses. Tuberculosis (TB) was found to be the commonest occupational disease in the current study. Various forms of TB such as pulmonary, miliary and MDR-TB are noted here,

contrary to Assiri, et al (2013:3) who report Chicken Pox as the commonest occupational disease among HCWs in a Saudi a Secondary Care Hospital.

5.8.6 Factors affecting workplace safety

This study's attribute workplace non-safety to lack of security, handling violent psychiatric patients, being exposed to contagious diseases, performing activities with potential to injury, and workplace violence. Further findings indicate that female participants were stressed by handling psychiatric patients who had tendencies to be aggressive. Participants also indicated that they were not trained to handle psychiatric patients, and therefore preferred male nurses to be assigned to psychiatric units. A literature review study of Eidhammer, et al (2014:2719) yielded supporting findings which indicate that mental health care users perpetrate violence against HCWs in mental health facilities due to the anger problems they face. It is less wonder then that, participants were of the opinion that male security personnel, the presence of police offers in the hospital premises, and hiring of more male nurses would provide security measures needed to ensure safety in the workplace.

Violence in the form of physical assault against HCWs is noted as mostly perpetrated by patients and their family members. This left some HCWs with permanent physical disabilities and negative mental perceptions of patients and management, and made participants reluctant to care for violent patients. Some violence emanated from co-workers, especially male medical personnel who tended to be verbally abusive to female nurses. The study by Esmailpour et al (2011:134) on workplace violence endured by Iranian nurses supports the findings of the current study as it also observes that violence against HCWs was perpetrated mainly family members, patients and co-workers.

5.8.7 Medical surveillance

The current findings reveal that periodic screening for hepatitis C was not done by a majority of the hospitals, and none of the hospitals conducted pre-employment screening. Similar results are reported in Tshitangano (2013:16) whose study findings indicate the non-existence of pre-employment screening programmes to rule out latent TB among HCWs in Vhembe. The current study further shows that the majority of the hospitals did mostly hepatitis B and TB screening. On the contrary Tshitangano (2013:17) and Zungu

and Malotle (2011:20) found out that correct TB screening tests, such as TST and interferon gamma release assays, are not being used for HCWs. One hospital gave measles vaccination and influenza vaccine. Periodic medical assessments were conducted at irregular intervals across various hospitals in this study, or only when there was an indication. Furthermore, the screening of participants on rotation from one ward to the other was conducted in very few participants in the current study. Five of the eight hospitals did not assign pregnant HCWs to other duties as a temporary relief arrangement.

Hence, it can be inferred that the general findings of the current study indicate that compliance with the Occupational Health and Safety Act (OHSA), 1993 (Act No. 85 of 1993) as amended, on medical screening is not adequate as none of the hospitals provide pre-employment medical examination to their nurses. Not all hospitals screened and or vaccinated their workers for TB, hepatitis B, hepatitis C, rubella, influenza and pertussis.

5.8.8 Findings on availability of OHS policy, implementation and compliance

The current study's findings show that all eight hospitals had an OHS nurse on site, and six had an internal OHS policy which was communicated to workers. However, only two hospitals displayed policies for workers to see. An inadequate compliance with OHS policy existence is confirmed Zungu and Malotle's (2011:20) literature review study that cites study findings from the University Research Co. LLC (URC) and the Desmond Tutu Tuberculosis Centre that was conducted in five South African provinces and reveals that only 40% of health facilities had a written OHS policy. All hospitals in the current study also reported the existence of OHS committee that was trained in OHS practices, and only three hospitals had trained first aiders on site.

Further findings indicate that all hospitals conducted risk assessments and workplace inspections, though the timing and intervals were different for all hospitals. Seven of the eight hospitals in this study had OHS signs and posters displayed around their hospitals. In general, the current study findings reveal a fair compliance to OHS policy existence and implementation. This visibility is supported by the stipulations of the OHSA, 1993 (No. 85 of 1993), as amended, which requires workplaces to have established OHS services, with a well displayed OHS policy (OHS Act No 85 of 1993:8), and structures such as the

OHS committee and worker representatives should be in existence as stipulated in the Act (OHS Act No 85 of 1993:5, 6).

5.9 CONCLUSION

This chapter analysed data and discussed the outcomes of the study. Results from the self-administered questionnaire were statistically and thematically presented, just as the associations between participants' demographics and biological hazards were highlighted in the chapter. The five thematic narratives developed from open-ended responses in the self-administered questionnaire are also discussed. Statistical and narrative descriptions of data presented from part A checklist, are focused on the review of hospitals' OHS documents regarding policy existence, implementation and compliance. The presentation of part B checklist covered retrospective review of hospitals' OHS records for occurrence of occupational diseases and injuries in the period 2011-2014.

The next chapter focuses on the summary, conclusions, limitations and recommendations of the study.

CHAPTER 6

SUMMARY, CONCLUSIONS, LIMITATIONS AND RECOMMENDATIONS OF THE STUDY

6.1 INTRODUCTION

This chapter presents a summary of the study's findings and conclusions and outlines recommendations drawn from the study findings, as well as the limitations of the study. The study investigated occupational health and safety practices prevailing in public hospitals in the Tshwane Healthcare District and used the findings to draw up guidelines to improve occupational health and safety practices that support the well-being of HCWs in the Tshwane Healthcare District public hospitals.

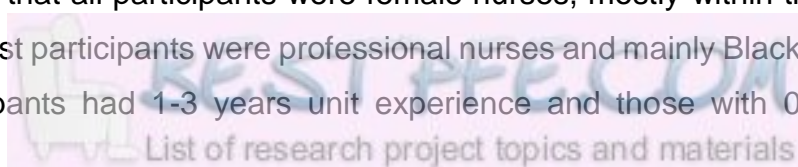
6.2 SUMMARY

The purpose of the study was to investigate the nature of occupational health and safety hazards and their impact among HCWs in selected public hospitals in the Tshwane Healthcare District, and to develop evidence-based guidelines that promote the health and safety of HCWs in the study sites. The study was conducted at eight public hospitals in the Tshwane Healthcare District of the Gauteng Province. The study triangulated by means of a quantitative descriptive cross-sectional survey, an observational inspection of environmental facilities and work-related practices, and a retrospective review of records on occupational injuries and diseases. The reviewed literature revealed the unhealthy and unsafe circumstances that HCWs work under, the nature and sources of occupational injuries and diseases and other hazards that affect HCWs physically or psychologically.

6.2.1 Summary of findings

6.2.1.1 Findings related to participants' demographic profile

The findings show that all participants were female nurses, mostly within the age group of 40-49 years. Most participants were professional nurses and mainly Black. The highest number of participants had 1-3 years unit experience and those with 0-10 years of



industry experience were in the majority. A majority of the participants worked in surgical units.

6.2.1.2 Findings related to the nature and sources of biological hazards

The study's findings reveal a high occurrence of NSI, negligent disposal of used needles, spills and splashes, constant exposure to HBAs and medical waste among HCWs. Professional nurses were the most affected by NSI, negligently disposed needles, high exposure to HBAs and medical waste and latex sensitisation. The reviewed hospitals' OHS records revealed 275 incidents of NSI from 2011-2014. Most of the NSI resulted from self-pricking incidents during the conduct of clinical procedures such as suturing an episiotomy or performing a haemogluco-test.

6.2.1.3 Findings related to the nature and sources of psychosocial hazards

The results in this section indicate that a majority of the participants reported experiences of work-related stress arising from a collective of psychosocial hazards, such as long hours of work and shift work, increased workloads, poor working relations among staff and poor management practices.

Findings related to increased workload

A majority of the participants regarded increased workloads as the worst stressor and leading to psychological strain which disabled them from rendering diligent work or executing quality care to patients.

Findings related to shift work and long working hours

Participants regarded long hours of work and shift work as stress factors due to the poor structuring of shift work, which makes them to experience long hours of work. Working a 12-hr shift consecutively results in exhaustion and insufficient rest periods. Hence, it was noted that there was staff absenteeism related to working unexpected extra hours, with the long working hours also affecting family life.

Findings related to poor working relations among staff

Poor working relations among staff were indicated as a source of stress. The findings also show that it existed between participants and management, ward seniors and juniors, colleagues and that participants endured verbal abuse by medical staff.

Findings related to poor management practices

Poor management practices were a concern for participants. The participants regarded managers as unsupportive, lacking supervision, unappreciative and abusive of their power. The managers lack good OHS practices, display poor allocation skills without regard for gender, mental status, pregnancy status, heavy workloads and high exposure to HBAs for HCWs.

6.2.1.4 Findings related to the nature and sources of work-related injuries and diseases

The findings on the occurrence of occupational injuries and diseases, over a 3 year cycle (2011-2014) indicate that slips, trips and falls (STF) were commonly reported by participants. Findings from participants and OHS records review did not indicate the sources of STF, but musculoskeletal disorders (MSDs) resulted from being injured by equipment such as medicine trolley, drip stand or patients' beds. Lower back pains were as a result of lifting and turning of patients. Occupational tuberculosis was the commonest occupational disease reported among HCWs.

6.2.1.5 Findings on conducting medical surveillance

The finding show that a vast majority of participants reported that they did not undergo pre-employment medical surveillance. In addition, very few participants confirmed that they were subjected to periodic medical surveillance to test for exposures to biological hazards.

6.2.1.6 Findings on workplace safety

Some participants felt that periodic safety inspections were not adequately conducted. Factors found out as contributing an unsafe workplace include lack of security, handling of violent psychiatric patients, exposure to contagious diseases, performing activities with potential to injury and workplace violence. The workplace violence against HCWs was mostly perpetrated by patients and their family members.

6.2.1.7 Findings on the availability of and compliance with the OHS policy at the study sites

The findings reveal the all hospitals had an OHS nurse on site with six having an internal OHS policy that was communicated to workers. Nonetheless, only two hospitals displayed the OHS policy for workers to see. There is also a lack of compliance to pre-employment screening, and vaccination for TB, rubella and pertussis. The risk assessments are not regular. Furthermore, the provision of PPE is inadequate and inconsistent at the majority of the District's public hospitals, although the provision of PPE intervals differed per hospital. Generally, there was poor to fair compliance to OHS policy existence and compliance.

6.3 RECOMMENDATIONS

The following recommendations are made basing on the findings of the current research:

Recommendations for policy

- It is recommended that policy makers at National level consider formulating a policy that specifically focuses on pregnancy and exposure to hazardous biological agents (HBAs) in the workplace in view of the burden of infectious diseases in public hospitals.

Recommendations for practice

The following are recommendations for practice seeking to influence OHS practice in the study sites:

- It is recommended that hospital management, as the custodians of good OHS practices, comply with the OHS policy. All hospitals need to have the OHS policy and display it visibly for all workers to see and familiarise themselves with.
- Medical surveillance of HCWs should be carried out according to the OHS legislation, i.e. during pre-employment, periodically, on transfer and on exit. All HCWs should be vaccinated against the stipulated occupational infections.
- Risk assessments should be scheduled and carried out as legislated and the findings should be recorded and communicated timeously to management in order to effect necessary interventions.
- It is recommended that the management skills be improved in order to ensure good OHS practices and advocacy for OHS promotion. Compassionate support to HCWs is further recommended given the stressors that HCWs face on a day-to-day basis.
- New technological devices, such as engineered devices used to protect against pricks by sharps or needles, should be provided to minimise the occurrence of NSI among HCWs.
- The provision of PPE should be adequate and consistent in order to maintain the desired level of protection against HBAs. Good quality gloves and sufficient powder-free gloves should be continuously provided to avoid HCWs buying their own. Enough supplies and laundry of gowns should also be ensured.
- Measures to ensure workplace safety, such as the posting of male security personnel along corridors and ward entrances, should be introduced to help alleviate violence perpetrated against HCWs. The use of male health care staff to care for aggressive patients and mental health care users is recommended in an attempt to alleviate violence.
- A good record keeping practice for OHS and standardisation of OHS registers and other OHS records is recommended as it enables data generation, the establishment of occupational injuries and disease trends, and measures the magnitude of burden of occupational injuries and diseases in SA health sector.
- A budget allocation seeking to acquire OHS staff and provide for a physical structure that is well equipped and able to provide relevant services to HCWs is recommended. Further to this is the recommendation that more personal health services, such as family planning, be made available for HCWs.

- It is also recommended that guidelines developed from the study be implemented among HCWs in Tshwane with the view of expanding them to the general population of HCWs in the whole country.

Recommendations for further research

- Further research is needed to assess the magnitude and impact of occupational diseases and injuries among HCWs at a national level.
- Further research after the implementation of guidelines developed in the current study is needed in order to establish the status of occupational health in the health sector.

6.4 CONTRIBUTIONS OF THE STUDY

It is envisaged that the study will contribute knowledge towards the promotion of healthy and safe workplaces for HCWs. In addition, the study is expected to contribute further towards curbing the occurrence of occupational diseases and injuries through guidance provided by the proposed guidelines.

6.5 LIMITATIONS OF THE STUDY

The study was confined to the Tshwane Healthcare District in the Gauteng Province, which affects the generalisability of the findings to the whole province and the country as a whole. The Tshwane Healthcare District has a total of eight (8) three-tier hospitals which were used in the study, even though the District has a further eighty-two (82) health care facilities such as clinics, community health centres (CHCs) and two specialized hospitals, which are not classified under the three-tier system, and this affects the generalising of the research results to the whole of the Tshwane district. There was a risk of recall bias due to self-reported responses from participants. Another challenge encountered by the researcher is related to the study design's retrospective record review, in which difficulties arose owing to the existence of incomplete and unstandardized records that were made available for the study. Furthermore, only female nurses responded to the questionnaire. There were no male participants, a finding which has implications for generalisation to male HCWs. The written responses from the open-ended questions in the questionnaire could not be probed to elicit an in-depth insight into the issues under discussion. Another

limitation was that multivariate analysis could have been used to eliminate variables that show association by chance in bivariate analysis using Chi₂ test.

6.6 CONCLUDING REMARKS

The study found out that the OHS stipulations from the OHSA, 1993 (Act No. 84 of 1993) as amended, were not adequately adhered to in all Tshwane public hospitals. HCWs need protection from dangers within the physical work environment and the psychosocial work environment, as well as the provision of resources for personal health, which can be achieved through good OHS practices.

The next chapter presents guidelines that were developed on the basis of the findings from the current study, and the literature review and theoretical foundation of the study.

CHAPTER 7

DEVELOPMENT OF GUIDELINES TO PROMOTE THE HEALTH AND SAFETY OF HEALTH CARE WORKERS IN PUBLIC HOSPITALS IN THE TSHWANE HEALTHCARE DISTRICT OF GAUTENG, SOUTH AFRICA

7.1 INTRODUCTION

This chapter presents evidence-based guidelines on the promotion of occupational health and safety among the HCWs in the Tshwane Healthcare District's public hospitals. The guidelines design is based on the study's main findings, theoretical framework used to support the study (which proposes ways in which occupational health and safety promotion for workers across the board can be achieved) and the reviewed related literature.

7.2 THE PURPOSE OF THE GUIDELINES

The broader purpose of the guidelines is to serve as a tool to promote healthy and safe physical and psychosocial work environments in health care settings, and in particular the health and safety of the HCWs in the Tshwane Healthcare District, by addressing the challenges and needs emanating from these various work environments. The specific purposes of the guidelines are, however, indicated in relevant section of table 7.1 in this chapter.

7.3 SCOPE OF THE GUIDELINES

The proposed guidelines are applicable to all HCWs employed in the Tshwane Healthcare District's public hospitals, who are susceptible to various risks and hazards at their workplaces. The guidelines may also be applied to the general HCWs population in the Gauteng Province and other South African provinces' public hospitals facing similar hazards and risks at their workplaces. These guidelines apply further to all gender groups as the existence of workplace hazards affects all irrespective of gender.

7.4 THE GUIDELINES' DEVELOPMENT AND ALIGNMENT PROCESS

A three-pronged approach guided the development of the guidelines, which are drawn from the current study findings, theoretical framework used in the study, and the reviewed OHS studies literature presented in chapter two of this report. The components of the World Health Organization Healthy Workplace Framework and Model (WHOHWFM), namely the physical and psychological work environment avenues, and the personal health resources avenue, were used to align the developed guidelines with the study findings. The WHOHWFM components consist of sub-components which were also taken into consideration during the development and alignment of the guidelines. The physical work environment avenue sub-components that were used to align the guidelines are the biological, chemical, ergonomic, physical hazards, occurrence of occupational injuries and diseases within the physical environment, and the existence of and compliance with the OHS policy. Similarly, the sub-components of the psychosocial work environment avenue used to develop and align the guidelines were work organisation, management practices, and workplace violence. Lastly the sub-components of the personal health resources avenue were used in the development process. The process also included the identification of the key OHS challenges encountered by the HCWs from the study findings and that of components and sub-components of the WHOHWFM that they were linked to. The researcher clarifies the purpose of the guideline per aspect of the WHOHWFM and develops the evidence based guidelines in alignment with the different components and sub-components of the WHOHWFM.

7.4.1 Rationale for employers to use the WHOHWFM as a basis for OHS promotion

The WHOHWFM is an OHS guide document that lays the ground for employers to take up leadership that engages workers in the quest for achieving occupational health promotion within the workplace, through hazard control and the elimination or reduction of risk (Burton 2010: 62). Managers should take the lead and be the custodians of good occupational health and safety practices. The achievement of good OHS practice requires managers to involve workers and their representatives in collaborative partnerships as elaborated in the WHOHWFM that occupational health and safety promotion is a collaborative process. Managers need to involve the HCWs in the decision-making processes in order to achieve an effective OHS system (Burton 2010: 62).

The going concerns of institutions, such as hospitals, can be achieved through the employers' adoption of the WHOHWFM which fosters the ethical, business and legal rationale and their organisations' considerations. Managers should understand the importance and impact of healthy workplaces on workers and organisations so that they can engage in a continuous improvement of health and safety in the workplace (Burton 2010: 7). An understanding of the need for health and safety enables managers to establish applicable OHS policies in the workplace, and ensure that the OHS policy is not only implemented but it is correctly complied with.

As the WHOHWFM is a guide document that cuts across various workers and workplaces, to establish an effective OHS system, employers are encouraged to adopt the WHOHWFM and adapt it to suit the HCWs and their respective environments (Burton 2010: 1). The effectiveness of the WHOHWFM lies in the incorporation and alignment of the guideline document with the strategic goals and operational plans of the organisation. A WHOHWFM that is not visible nor aligned with strategic objectives is not likely to succeed (Burton 2010: 86).

7.4.2 Requirements for the implementation of the WHOHWFM

According to Burton (2010:62), the implementation of the WHOHWFM requires organisational commitment which is evident through: (i) the existence of OHS policy and other supporting policies; (ii) leadership engagement and commitment towards providing an effective OHS system (iii) worker involvement at decision making level regarding OHS issues, to ensure worker commitment towards occupational health and safety promotion; and (iv) an enabling culture and environment that supports good OHS practice.

7.4.3 The guidelines table

The guidelines are presented in a tabular form that highlights the key areas of challenge to HCWs. The key challenging areas are aligned with specific aspects of the WHOHWFM, both of which are aligned to particular findings noted in the current study, the specific purpose of the guideline and the actual recommended evidence-based guideline statement as depicted in table 7.1 hereunder.

Table 7.1 Evidence-based guidelines for promotion of health and safety for health care workers in the Tshwane healthcare district public hospitals

Key areas of challenge to the HCWs	Aspects of the WHOHWFM	Purpose of the guideline	Findings from the study (Participants' questionnaire)	Proposed/recommended guidelines
	The physical work environment avenue			
Exposure to hazardous biological agents (HBAs) in the workplace	Biological hazards The WHOHWFM suggests that the health and safety of workers in the workplace is compromised by the existence of biological hazards in the physical work environment which render the workplace unhealthy.	To promote the health, safety and wellbeing of HCWs by eliminating or reducing the occurrence of biological hazards in the physical work environment as suggested in the WHOHWFM.	Experiences of needle stick injuries (NSI) by HCWs due to negligently disposed needles.	Hospitals need to acquire safety devices designed to prevent or reduce injuries by sharps among nurses as they constantly get exposed to patients' blood and body fluids which are potentially infected. Avoid overfilling of sharps buckets. Timeous collection and replacement of waste collection boxes, plastics and buckets to avoid accidental pricks and reservoirs for HBAs.
			Experiences of self-pricks by HCWs due to factors such as uncooperative or aggressive patients and accidental pricks by colleagues.	Continual education of health care staff regarding proper disposal of used needles and sharps.

Key areas of challenge to the HCWs	Aspects of the WHOHWF	Purpose of the guideline	Findings from the study (Participants' questionnaire)	Proposed/recommended guidelines
				<p>Educate patients regarding the need for cooperation during blood taking or finger pricking procedures, as non-cooperative behaviour results in accidental self-pricks (ASP) by HCWs.</p>
			<p>Experiences of spills and splashes by HCWs during performance of patient care procedures.</p>	<p>There should be adequate and consistent supply of PPE (latex gloves, powder-free gloves, masks, N95, goggles, gowns, coveralls, caps, and boots) to ensure safety against splashes and spills.</p> <p>Ensuring that HCWs adhere to strict aseptic techniques when conducting invasive and non-invasive procedures on patients.</p>
			<p>Constant exposure to biological hazards was found to be common among HCWs working in medical wards.</p>	<p>Infection control nurse to ensure compliance with hand washing procedures to help minimise the spread of HBAs in the health care workplace.</p> <p>Ensuring compliance with universal precautions to protect nurses from exposure to HBAs and to protect the hospitals from liability costs and sickness absence costs.</p>

Key areas of challenge to the HCWs	Aspects of the WHOHWF	Purpose of the guideline	Findings from the study (Participants' questionnaire)	Proposed/recommended guidelines
			The disposal of medical or hazardous waste in some hospitals was not effective.	<p>Timeous collection and replacement of waste collection boxes, plastics and buckets on weekends and holidays.</p> <p>Enforce the: correct segregation of waste materials, adherence to correct usage of colour-coded waste plastic bags, and adequate and consistent supply of waste collection materials.</p>
			Concerns regarding staff attitudes towards noncompliance to correct waste disposal, and the need to educate patients about waste disposal.	<p>Address staff attitudes regarding wrong disposal of medical waste, and the need for adherence to proper waste disposal procedures and standards.</p> <p>Educate patients about proper waste disposal.</p>
			Inadequate and inconsistent availability of PPE and consumables.	<p>HCWs should be supplied consistently with adequate PPE (latex gloves, powder-free gloves, masks, N95, goggles, gowns, coveralls, caps, and boots) with the right fit to ensure safety against splashes and spills.</p>

Key areas of challenge to the HCWs	Aspects of the WHOHWFM	Purpose of the guideline	Findings from the study (Participants' questionnaire)	Proposed/recommended guidelines
				<p>Adequate and consistent provision of hand wash consumables.</p> <p>Infection control nurse to ensure compliance to hand washing procedures to help minimise the spread of HBAs in the health care workplace.</p>
	The physical work environment avenue			
Exposure to chemical hazards	<p>Chemical hazards</p> <p>The health and safety of workers in the workplace is affected by the existence of chemical hazards in the physical work environment which contribute to an unhealthy workplace.</p>	To promote the health, safety and wellbeing of HCWs by eliminating or reducing the occurrence of chemical hazards in the physical work environment as suggested in the WHOHWFM.	<p>HCWs workers experienced latex allergy with poor supplies of powder-free gloves by management.</p> <p>Central hospitals had more incidents of exposure to hazardous drugs</p>	<p>HCWs to report signs of reaction to ensure early detection of health problems.</p> <p>HCWs with showing signs of latex allergy to be provided with adequate and consistent supplies of powder-free gloves.</p> <p>Proper cleaning of surfaces contaminated with hazardous drugs.</p> <p>Adequate and consistent supply of PPE to protect nurses against hazardous drugs.</p>

Key areas of challenge to the HCWs	Aspects of the WHOHWFM	Purpose of the guideline	Findings from the study (Participants' questionnaire)	Proposed/recommended guidelines
				<p>HCWs handling and giving neoplastic drugs to be fully clad in PPE to protect them from contamination with the toxic drugs.</p> <p>Reporting of any signs of reaction should be encouraged so ensure early detection of health problems.</p>
	The physical work environment avenue			
Exposure to physical hazards.	<p>Physical hazards</p> <p>The physical hazards in the work environment render the workplace unhealthy and thus compromise the health and safety of workers in the workplace.</p>	To promote the health, safety and wellbeing of HCWs by eliminating or reducing the occurrence of physical hazards in the physical work environment as suggested in the WHOHWFM.	Slips, trips and falls (STF) were found to be common among HCWs in all hospitals.	Structural design of buildings should not have bumps and humps inside the wards to prevent the occurrence of STF. The structure of public hospitals needs to be maintained and repairs done speedily to curb STF. Gradient slopes should therefore be marked with danger signs, with all stairs provided with hand side rails and marked at the top and bottom to prevent STF.

Key areas of challenge to the HCWs	Aspects of the WHOHWFM	Purpose of the guideline	Findings from the study (Participants' questionnaire)	Proposed/recommended guidelines
	The physical work environment avenue			
Exposure to ergonomic hazards.	Ergonomic hazards The WHOHWFM suggests that the health and safety of workers in the workplace is affected by the existence of ergonomic hazards in the physical work environment which render the workplace unhealthy.	To promote the health, safety and wellbeing of HCWs by eliminating or reducing the occurrence of ergonomic hazards in the physical work environment as suggested in the WHOHWFM.	Participants expressed discomfort with the experiences of lifting heavy patients and equipment.	Provide assistive devices to help nurses with lifting, moving and transfer of heavy and very sick patients to avoid injuries to the back. HCWs should be continuously trained in techniques of proper bending and lifting, so as to avoid hurting their backs.
			HCWs expressed discomfort with the experiences of carrying patients by themselves, from one unit to the other, when lifts are not working.	Lifts need to be maintained and kept in good working order at all times especially in those hospitals with upper stores where stairs cannot be used to ferry patients from one unit to the other.
	Occupational diseases in the physical work environment			
Occurrence of occupational diseases	Occupational diseases The WHOHWFM suggests that the health and safety of workers in the workplace is compromised by the occurrence of occupational diseases in the physical work	To prevent or reduce the occurrence of occupational diseases in the physical work environment as suggested in the WHOHWFM.	HCWs, especially those from the medical units, were exposed to HBAs and contracted infectious diseases.	Implement a proper screening of patients with suspected infectious conditions and use precautionary measures to curb transmission of HBAs, and maintenance of good

Key areas of challenge to the HCWs	Aspects of the WHOHWFM	Purpose of the guideline	Findings from the study (Participants' questionnaire)	Proposed/recommended guidelines
	environment which render the workplace unhealthy			<p>hygiene and cleanliness in the patient care environment.</p> <p>Develop a supportive system to ensure proper reporting and monitoring of occupational exposure to infectious agents.</p>
			<p>A retrospective review of the OHS records from all hospitals indicated tuberculosis as the common occupational disease that was contracted by a number of HCWs.</p>	<p>Promote cross ventilation to remove airborne droplets and replace with well-ventilated air.</p> <p>Encourage vaccination for occupational diseases such as TB.</p> <p>Ensure compliance to hand hygiene by both HCWs and patients themselves to minimise the spread of HBAs (Deuffic-Burban, et al 2011:5). In addition, the separation of coughing patients from the non-coughing ones even before a confirmed diagnosis of tuberculosis (TB), is essential to curb the spread of TB to other patients and ultimately HCWs (Galgalo et al 2008:952).</p>

Key areas of challenge to the HCWs	Aspects of the WHOHWF	Purpose of the guideline	Findings from the study (Participants' questionnaire)	Proposed/recommended guidelines
				<p>Screening of HCWs for TB and taking environmental swabs, are some of the infection control measures that need to be emphasised and supervised (Danzmann et al 2013:3). Screening of HCWs for TB and taking environmental swabs, are some of the infection control measures that need to be emphasized and supervised (Danzmann et al 2013:3).</p> <p>Supply adequate and consistent personal protective equipment (PPE) to protect HCWs against exposure to TB.</p>
	Occupational injuries in the physical work environment			
Occurrence of occupational injuries	<p>Occupational injuries</p> <p>The WHOHWF suggests that the health and safety of workers in the workplace is compromised by the occurrence of occupational injuries in the physical work environment which render the workplace unhealthy.</p>	To prevent or reduce the occurrence of occupational diseases in the physical work environment as suggested in the WHOHWF.	Slips, trips and falls (STF) were found to be the highest cause of occupational injuries.	Use of signs to warn against potential sources of STF (repairs on tiles, bumps on the ground, damaged carpets, spills, loose lying cords). Repairs and maintenance of light bulbs along stairs, corridors, and premises of the facility should be made.

Key areas of challenge to the HCWs	Aspects of the WHOHWF	Purpose of the guideline	Findings from the study (Participants' questionnaire)	Proposed/recommended guidelines
				<p>Repairs and service on lifts to be adequately done to avoid nurses having to carry patients along the stairs from one floor to the other as this may lead to MSDs.</p> <p>HCWs should be encouraged to wear slip resistant shoes on slippery floors to prevent accidental slipping and falling.</p>
			<p>Participants were concerned about consequences of lifting and carrying heavy patients and objects on their health.</p>	<p>Acquisition of patient lifting devices and training of HCWs on the usage of such equipment to avoid injuries is recommended.</p> <p>Use of male staff to assist with lifting of heavy and very sick patients.</p> <p>Get experts to train nurses in the maintenance of good posture when doing bending-related activities during patient care.</p> <p>Nurses should be encouraged to report all work-related injuries to the OHS department.</p>

Key areas of challenge to the HCWs	Aspects of the WHOHWFM	Purpose of the guideline	Findings from the study (Participants' questionnaire)	Proposed/recommended guidelines
			Hospital records review from 2011-2014 revealed incomplete and unstandardised records of occupational injuries.	Good record keeping of injuries sustained at work is recommended and should be kept with regards to gender, age, nursing category, type of unit, year of employment, type of injury, hazards involved, treatment, number of sick days, medical boarding, follow-up dates, date of COIDA claim and the outcome of claim.
	OHS policy existence and compliance – physical work environment avenue			
OHS policy existence, implementation and compliance.	The WHOHWFM proposes the promotion of health in the workplace through the development and implementation of policies seeking to achieve health, with the OHS policy as example in this context.	To encourage all hospitals to have an OHS policy, whose requirements regarding the conducting of workplace risk assessments and surveillance of workers for occupational health related problems, they will comply with.	Not all hospitals had an OHS policy and those that had it, did not comply fully with stipulations.	All hospitals should have an existing OHS policy that is visibly displayed for workers to read and familiarise themselves with. Regular inspections should be scheduled and conducted by an OHS team that involves worker representatives. There should be trained first aiders on site.
	Medical surveillance According to the WHOHWFM, promotion of			Pre-employment screening should be conducted to

Key areas of challenge to the HCWs	Aspects of the WHOHWF	Purpose of the guideline	Findings from the study (Participants' questionnaire)	Proposed/recommended guidelines
	health in the workplace, entails screening workers for occupational diseases.		Medical surveillance of HCWs was not complied with in the current study.	<p>determine fitness-for-the-job and to assist with proper placement.</p> <p>Initial assessments should be conducted to provide baseline of health status, and subsequent periodic medical assessments to be conducted per scheduled intervals. The outcome of periodic assessments should be used to compare the initial assessment and current health status, to check for probable health deviations.</p>
	<p>Risk assessments</p> <p>The WHOHWF proposes that to maintain a healthy and safe workplace, hazards should be controlled and risks should be eliminated or reduced, and this can be achieved through risk assessments in the work environment.</p>		Risk assessments and safety inspections found to be done haphazardly in a majority of the hospitals and without proper scheduling of the assessment, and they were conducted by the infection control nurse in the majority of hospitals.	Risk assessments and safety inspections should be conducted in accordance with the OHS Act, 1993 (Act 85 of 1993) as amended, and should be conducted by the OHS team consisting of the OHS nurse, risk manager, infection control nurse, quality assurance nurse, environmental health inspectors, HCWs representatives, organised labour, and representative

Key areas of challenge to the HCWs	Aspects of the WHOHWFM	Purpose of the guideline	Findings from the study (Participants' questionnaire)	Proposed/recommended guidelines
				from management and workers, to assess the work environment for hazards.
	The psychosocial work environment avenue			
Psychological stress due to poor work organisation	<p>Increased workload</p> <p>Poor work organisation in the WHOHWFM has been highlighted as the cause of psychological stress among workers, and this includes issues such as increased workload, long hours of work and shift work.</p>	To propose workable solutions that will alleviate psychological stress among HCWs emanating from increased workload, long working hours and shift work.	Increased workload was found to be contributory to psychological stress among HCWs, as it resulted in poor quality care to patients.	<p>More staff should be hired to alleviate staff shortage. HCW training needs to be re-evaluated and staffing profiles revised to cater for increased demand for staff.</p> <p>Equipment and machinery that are broken need to be fixed to alleviate work pressure and reduce patient waiting time which is stressful for HCWs. Adequate material resources should be supplied to help HCWs provide quality care which they regard as psychologically fulfilling.</p> <p>Proper screening of patients to avoid unnecessary admissions of patients who may be attended to in community health centres</p>

Key areas of challenge to the HCWs	Aspects of the WHOHWFM	Purpose of the guideline	Findings from the study (Participants' questionnaire)	Proposed/recommended guidelines
				(CHCs), as this causes high workload.
	<p>Long hours of work</p> <p>Long hours of work is indicated in the WHOHWFM as one of the work organisation factors resulting in psychosocial stress.</p>		<p>Long hours of work due to poor structuring of duty schedules were stressful and resulted in insufficient rest and exhaustion.</p>	<p>Work hours should not to be structured in a manner where a 12hr shift follows another 12hr shift consecutively for 3days as this causes physical and psychological strain.</p> <p>Managers should engage HCWs in the structuring of duty schedules to ensure staff satisfaction and at the same time achieve ward coverage.</p> <p>HCWs need not to be forced to work an unexpected extra shift due to staff absenteeism, hence, managers should seek the services of external agents to bridge absenteeism and allow HCWs time to rest.</p> <p>Tea and lunch breaks should be enforced to encourage rest breaks, with the provision of rest rooms where nurses can rest during breaks being extremely essential. HCWs should take 1hr rests or naps</p>

Key areas of challenge to the HCWs	Aspects of the WHOHWFM	Purpose of the guideline	Findings from the study (Participants' questionnaire)	Proposed/recommended guidelines
				during night duty on a rotational basis.
	<p>Shift work</p> <p>The WHOHWFM has indicated shift work as one of the work organisation factors resulting in psychosocial stress.</p>		<p>HCWs indicated that shift work was stressful in terms of structure and that it affected family life.</p>	<p>Flexi but well controlled and well-structured shifts may be used to maintain ward coverage and help alleviate the stress resulting from shift work. Flexi hours may help HCWs to accommodate their family expectations.</p>
<p>Working relations among staff.</p>	<p>Working relations among staff</p> <p>The WHOHWFM has highlighted the importance of good working relationships in achieving psychological health.</p>	<p>To promote healthy working relationships among HCWs.</p>	<p>Poor working relationships among staff were reported as rampant and a stressful factor as this destroyed teamwork for some HCWs, who cited issues such as lack of cooperation and verbal abuse by other HCWs as examples.</p>	<p>Promote a positive culture that fosters good interpersonal relations between female-female nursing colleagues, female-male nursing colleagues, and female nurses - male medical staff by:</p> <ul style="list-style-type: none"> • holding meetings to resolve conflict • holding tea conversations <p>Promote teamwork to enhance psychological wellbeing of nurses by introducing team building exercises.</p>

Key areas of challenge to the HCWs	Aspects of the WHOHWFM	Purpose of the guideline	Findings from the study (Participants' questionnaire)	Proposed/recommended guidelines
				<p>Create an atmosphere of respect for nurses by acknowledging their hard work, commitment and dedication.</p> <p>Foster a spirit of encouragement by awarding best performance for the week or month and provide certification of acknowledgement.</p> <p>Staff absenteeism and late coming to be addressed as they are cited as contributory factors towards poor work relationships.</p> <p>Fair and equal delegation of duties needs to be employed so that some HCWs are not found to be overloaded with work while others are not, as this gives rise to feelings of anger and demotivation.</p>
<p>Poor management practices and skills</p>	<p>Management factors</p> <p>The WHOHWFM proposes that management investment in occupational health and safety is essential for the</p>	<p>To encourage managers to investment in OHS promotion, which is reliant on</p>	<p>Findings revealed that poor management skills with regards to staff allocation was a source of stress as</p>	<p>Allocating staff according to their area of preference will motivate HCWs to work and boost their morale.</p>

Key areas of challenge to the HCWs	Aspects of the WHOHWFM	Purpose of the guideline	Findings from the study (Participants' questionnaire)	Proposed/recommended guidelines
	achievement and promotion of health for workers.	their good managerial practices and skills.	managers did not consider issues of gender, ill-health, pregnancy, age and personal preferences.	<p>Night duty must be allocated first to those who prefer it, before being it is allocated to general staff. This assists in relieving the stress within HCWs as they have preferences that should be acknowledged and respected.</p> <p>Allocation of HCWs with depression should in psychiatric units should be minimised or prevented as this may add to further stress which the particular HCWs might find severely difficult to handle.</p> <p>Allocation of HCWs with known chronic debilitating diseases should not be done to medical wards.</p> <p>Allocation should not be a top-down exercise but rather gather inputs and suggestions from HCWs to avoid absenteeism and unwarranted sick leave.</p>
			Findings indicated that managers lacked good OHS	Provision of adequate, consistent consumables and other material resources is a

Key areas of challenge to the HCWs	Aspects of the WHOHWFM	Purpose of the guideline	Findings from the study (Participants' questionnaire)	Proposed/recommended guidelines
			practices and abused their power.	<p>management prerogative which should be exercised considerably and be seen to facilitate quality care as HCWs require necessities to perform their work within acceptable standards.</p> <p>Managers should involve HCWs in decisions affecting their health and safety. They should further engage HCWs in problem solving, as this will have relevant stakeholders participating and committing towards occupational health promotion and organisational goal achievement.</p>
			Findings indicated that HCWs were stressed by managers who were unsupportive, aggressive and unapproachable	<p>Managers must be supportive to HCWs when having personal or patient related challenges that effect their productivity.</p> <p>Managers should not scold and insult HCWs, but rather display support when HCWs present their problems. Aggressive and authoritative behaviour scares away HCWs and compromises patient care and the wellbeing of HCWs.</p>

Key areas of challenge to the HCWs	Aspects of the WHOHWFM	Purpose of the guideline	Findings from the study (Participants' questionnaire)	Proposed/recommended guidelines
				<p>Managers should be approachable, accessible and caring, and commit to the psychological health promotion of HCWs.</p>
<p>Poor support for pregnant HCWs</p>	<p>Workplace pregnancy</p> <p>Pregnant in the workplace requires a supportive environment for workers, to help them deal with the demands of pregnancy and those of the work environment.</p>	<p>To foster a supportive environment for HCWs to help them deal with the demands of pregnancy and the work environment.</p>	<p>HCWs were concerned about lack of a supportive environment for pregnant HCWs.</p>	<p>Managers need to develop a specific policy on pregnancy among HCWs which will guide all levels of managers about how to handle pregnancy in the workplace and promote health and safety for the mother and foetus.</p> <p>Allocation of pregnant HCWs should be highly considerate of hazardous wards and where pregnant HCWs may contract HBAs that may compromise their pregnancy.</p> <p>Wards with heavy workloads and lifting of heavy patients need to be staffed by non-pregnant staff with those who are pregnant being spared the workload.</p>

Key areas of challenge to the HCWs	Aspects of the WHOHWFM	Purpose of the guideline	Findings from the study (Participants' questionnaire)	Proposed/recommended guidelines
				<p>The type of a shift and spread of working hours should be considerably planned to avoid health-related problems. This may be addressed by having a completely different shift schedule for pregnant workers which can be utilised for all pregnant HCWs.</p> <p>Managers must educate HCWs about the importance of reporting pregnancy early so that they can be assisted and supported throughout.</p>
	The psychosocial work environment avenue			
Unsafe workplace	<p>Workplace violence</p> <p>A safe work environment, as suggested in the WHOHWFM, promotes psychological well-being, and is required for the effectiveness and productivity of workers.</p>	<p>To propose measures that can be adopted by hospital management to ensure that public hospitals are supportive environments and safe workplaces to enable HCWs to work without the burden of psychological stress.</p>	<p>Participants were concerned about safety in public hospitals and regarded the hospitals as unsafe workplaces.</p>	<p>The use of male security instead of female security to protect HCWs is recommended. Female security lack the physical strength to protect female nurses against male perpetrators of violence. Male security to be posted along the corridors, ward entrances and hospital premises.</p>
			<p>The study findings indicated that HCWs experienced</p>	<p>Mixing of patients should be addressed by avoiding the</p>

Key areas of challenge to the HCWs	Aspects of the WHOHWFM	Purpose of the guideline	Findings from the study (Participants' questionnaire)	Proposed/recommended guidelines
			violence which was mostly perpetrated by patients and family members, and in some cases by co-workers	<p>placement of psychiatric patients in medical wards, and making sure that they are not nursed by HCWs who do not have a psychiatric qualification and not skilled in handling such patients.</p> <p>Reprimand perpetrators of violence against HCWs. That is, patients and family members should be educated about the consequences of their behaviour.</p> <p>Educate patients regarding compliance to treatment to avoid defaulters being admitted back with drug resistant conditions and causing more work pressure on the HCWs.</p>
	The psychosocial work environment avenue			
Lack of support for home-work life balance	<p>Home-work imbalance</p> <p>The WHOHWFM requires that workers be provided with a supportive environment, resources and the flexibility to support their efforts to improve or maintain health.</p>	To help provide an environment that is supportive, flexible and with resources that support their efforts to improve or maintain health.	HCWs were not able to meet their family demands due to work pressures.	Restructuring of shifts to avoid working excessively long hours can assist HCWs have extra time to focus on their families.

Key areas of challenge to the HCWs	Aspects of the WHOHWFM	Purpose of the guideline	Findings from the study (Participants' questionnaire)	Proposed/recommended guidelines
				<p>Restructuring of work schedules to allow HCWs to travel safely to and from work, and avoid travelling in the dark. The use of an off-request book when planning duty schedules should be emphasised so that proper planning is done and requests are honoured, as this will allow HCWs time to be with family when needed.</p> <p>Provision of crèche facilities for staff might alleviate the worry and stress of child minding issues.</p>
	The personal health resources avenue			
Lack of provision of services for personal health	<p>Provision of personal health services</p> <p>The WHOHWFM proposes that employers need to provide workers with a supportive environment, resources and services, opportunities and flexibility that promotes personal health to ensure that workers' well-being is provided in totality and not only focus on aspects of the workplace.</p>	To encourage employers to support the promotion of the physical and mental health of HCWs through the provision of personal health services, opportunities and resources in the workplace.	HCWs were not provided with personal health services within the workplace and these services ensure that their personal wellbeing is well taken care of.	<p>HCWs need to be allowed to access personal health services, such as family planning service, within their immediate health facility.</p> <p>They should not be seen seeking such services outside their work premises, as this might result in unplanned pregnancies if the outside</p>

Key areas of challenge to the HCWs	Aspects of the WHOHWFM	Purpose of the guideline	Findings from the study (Participants' questionnaire)	Proposed/recommended guidelines
				<p>service are not easily accessed.</p> <p>HCWs should be allowed to book screening examination for breast and cervical cancer within their workplaces to encourage early detection and treatment of health deviations, and to alleviate the anxiety and stress of not knowing their health statuses.</p> <p>Provide services of a psychologist to help HCWs with personal issues that impact on psychological health and might spill over to the workplace.</p> <p>Provide debriefing sessions for HCWs to help them cope with work-related stressors.</p> <p>Staff transport facilities for HCWs to help them against the dangers of travelling in the dark to and from work and experiencing criminal acts.</p>

Key areas of challenge to the HCWs	Aspects of the WHOHWFM	Purpose of the guideline	Findings from the study (Participants' questionnaire)	Proposed/recommended guidelines
				<p>Opportunities for growth need to be developed for HCWs so that they can grow in knowledge and skills, feel empowered and psychologically fulfilled.</p>

7.5 IMPLEMENTATION PLAN FOR THE DEVELOPED GUIDELINES

The researcher will approach senior management at the hospitals where the research was undertaken to request permission to pilot the implementation of the developed guidelines with a view to having them adopted and fully implemented. The guidelines will first be introduced to the hospital managers where the researcher conducted the study, and the researcher will advocate for their adoption by hospital managers. Piloting will take place within one year of guidelines development to validate and refine the guidelines if necessary with a view to motivate for a roll-out plan for scaling up the adoption of the guidelines on a national scale.

The implementation will follow after the guidelines have been piloted and in consultation with the National Department of Health and other relevant key role players. The guidelines are recommended for implementation by managers and other senior personnel in the public hospitals.

7.6 EVALUATION OF THE GUIDELINES

It is envisaged that an evaluation of the guidelines occurs during the pilot implementation process to assess if they are able to achieve the purpose they are developed for. A guidelines evaluation is imperative to ensure continuous improvement of the workplace. A measurement tool with criteria that check for alignment of the guidelines with current trends in the workplace is required. A monitoring tool is also vital to ensure that OHS expectations are met. The evaluation may not be a true reflection of the process being evaluated if monitoring is not done.

The evaluation criteria will be the recommended guidelines actions, and evaluation will take the form of visitations to the respective hospitals to assess the existence of an OHS policy and whether all aspects of the policy are complied with. The assessment will check if pre-employment examinations are performed, whether health surveillance is complied with, determine whether HCWs are vaccinated against relevant occupational diseases, evaluate OHS records for completeness and accuracy, and focus on recommended guideline actions.

7.7 IMPLICATIONS FOR HOSPITAL MANAGEMENT

It is envisaged that the implications of an effective implementation of the proposed guidelines is that hospital management would provide for the following measures:

A supportive work environment that is ensured through leadership engagement and HCW involvement in decision making regarding how workplace should be achieved for all and by all. The buy-in of workers and their representatives in health and safety promotion needs strategic engagement with workers for them to commit and take ownership of their safety and the safety of fellow workers.

A supportive environment requires the development of policies by management, which support an idealistic workplace culture. A workplace culture that fosters a positive worker mental health should be the goal of management.

Hospital management should commit and take leadership in safety promotion by undergoing training themselves and arranging training for workers on a continuous basis, which needs to be monitored and evaluated. Training should encourage the recognition and reporting of workplace hazards by workers, so that timeous corrective interventions can be instituted.

Management should familiarise themselves with the recommended evidence-based guidelines and see how and what strategies they can put in place to implement the guidelines, and monitor and evaluate whether the guidelines are effective or not. If not, management should then see how they can adapt them to suit their immediate environment.

7.8 IMPLICATIONS FOR THE GOVERNMENT

The implications of the proposed guidelines to the Department of Health are that a good OHS practice is a mandate of the government, the policy maker and the employer of HCWs in the public hospitals with a mandate to ensure the implementation of evidence-based OHS practice. The government, through the Department of Labour, has a role to ensure that its public hospitals comply with OHS legislation, through inspections of

hospitals, corrective action, recommendations and penalties where public hospitals are not compliant.

The monitoring and evaluation of occupational health and safety compliance is required if the government is intent on achieving health and safety for its HCWs. Support structures that facilitate achievement of good OHS practices will not only have to be put in place, but should monitor and evaluate compliance with OHS requirements.

7.9 DISSEMINATION OF THE GUIDELINES

It is envisaged that the proposed guidelines will be disseminated through different the mediums, forums, or organisations. Health care workers, managers, occupational health practitioners, stakeholders from government, organised labour and other relevant stakeholders in the health care industry, will be able to access the guidelines. Different modes of dissemination of guidelines will include publications in occupational health related journals, presentation at conferences on a national and international level, workshops and seminar presentations. The hard copies of the report containing guidelines will be accessible through the UNISA library, and the library website will contain a soft copy of the research report and the set guidelines.

7.10 CONCLUSION

This chapter presented the evidence-based guidelines, on the basis of the study findings, literature review and the WHOHWFM, which are needed to promote occupational health and safety among HCWs in the South African healthcare industry and in achieving healthier and safer public hospitals. It is evident here that a full compliance with the guidelines will contribute towards promoting a culture of good OHS practice in the healthcare industry and also result in tremendous benefits for the well-being of HCWs. These evidence-based guidelines are not a replacement but should be used in conjunction with OH Services for HCWs in the National Health Service of South Africa: A Guideline Booklet, 2003, and other guidelines ever developed for use by the South African HCWs.

LIST OF REFERENCES

- Abuelhassan, W. 2012. Hepatitis C virus infection in 2012 and beyond. *South African Journal of Epidemiology and Infection* 27(3):93-97.
- Al-Qutop, M-A & Harrim, H. 2011. Quality of worklife human well-being linkage: Integrated conceptual framework. *International Journal of Business and Management* 6(8):193-205.
- Al-Thani, H, El-Menyar, A, Abdelrahman, H, Zarour, A, Consunji, R, Peralta, R, Asim, M, El-Hennawy, H, Parchani, A & Latifi, R. 2014. Workplace-related traumatic injuries: Insights from a Rapidly Developing Middle Eastern Country. *Journal of Environmental and Public Health* Article ID 430832:[1-8].
From: <http://www.hindawi.com/journals/jep/2014/430832/> (accessed 11 January 2016).
- Alhojailan, MI. 2012. Thematic analysis: A critical review of its process and evaluation. *West East Journal of Social Sciences* 1(1):40-47.
- Assiri, AM, Hathout, HM, Anwar, MM, El Dalatony, MM & Abdel Kader, NM. 2013. Occupational Infections among Health care workers in a secondary care hospital Saudi Arabia. *Occupational Medicine and Health Affairs* 1(7):[1-4].
- Aspinall, EJ, Hawkins, G, Fraser, A, Hutchinson, SJ & Goldberg, D. 2011. Hepatitis B prevention, diagnosis, treatment and care: a review. *Occupational Medicine* 61(8):531-540.
- Averhoff, FM, Glass, N & Holtzman, D. 2012. Global burden of hepatitis C: Considerations for healthcare providers in the United States. *Clinical Infectious Diseases* 55(1):10-15.
- Avilés-Palacios, C, López-Quero, M & García-López, MJ. 2013. Gender and maternity considerations and techniques in occupational health services: The Spanish case. *Safety Science* 58: 27-31. From: www.elsevier.com/locate/ssci (accessed 05 March 2014).
- Barofsky, I. 2012. Can quality or quality-of-life be defined? *Quality of Life Research* 21:21(4):625-633.

Bearman, G, Bryant, K, Leekha, S, Mayer, J, Munoz-Price, LS, Murthy, R, Palmore, T, Rupp, ME & White, J. 2014. Healthcare personnel attire in non-operating-room settings. *Infection Control and Hospital Epidemiology* 35(2):107-121.

Beck, CT. 2013. *Routledge international handbook of qualitative nursing research*. New York: Taylor & Francis.

Belin, A, Zamparutti, T, Tull, K & Hernandez, G. 2011. *Occupational health and safety risks for the most vulnerable workers*. Brussels: European Parliament.

From: <http://vulnerable-workers-/3467.aspx csdle.lex.unict.it/.../Occupational-health-and-safety-risks-for-the-most-vulnerable-workers-/3467.aspx> (accessed 5 March 2014).

Berninger, A, Webber, MP, Weakley, J, Gustave, J, Zeig-Owens, R, Lee, R, Al-Othman, F, Cohen, HW, Kelly, K & Prezant, DJ. 2010. Quality of life in relation to upper and lower respiratory conditions among retired 9/11-exposed firefighters with pulmonary disability. *Quality of Life Research* 19(10):1467-1476.

Biswal, S. 2013. Liquid biomedical waste management: An emerging concern for physicians. *Muller Journal of Medical Sciences and Research* 4(2):99-106.

Bolge, SC, Doan, JF, Kannan, H & Baran, RW. 2009. Association of Insomnia with Quality of Life, Work Productivity, and Activity Impairment. *Quality of Life Research* 18(4):415-422.

Bourbonnais, R, Brisson, C & Vézina, M. 2011. Long-term effects of an intervention on psychosocial work factors among healthcare professionals in a hospital setting. *Occupational and Environmental Medicine* 68(7):479-486.

Brown, SJ. 2012. *Evidence-based nursing: The research-practice connection*, 2nd edition. Canada: Jones & Bartlett Learning.

Brown, SJ. 2014. *Evidence-based nursing: The research-practice connection*. 3rd edition. Canada: Jones & Bartlett Learning.

Buijs, PC, Lambeek, LC, Koppenrade, V, Hooftman, WE & Anema, JR. 2009. Can workers with chronic back pain shift from pain elimination to function restore at work? Qualitative evaluation of an innovative work related multidisciplinary programme. *Journal of Back and Musculoskeletal Rehabilitation* 22(2):65-73.

Burton, J. 2010. *World Health Organization Healthy workplace framework and model: background document and supporting literature and practices*. Geneva: World Health Organization.

Bussi eres, J-F, Tanguay, C, Touzin, K, Langlois,   & Lefebvre, M. 2012. Environmental Contamination with Hazardous Drugs in Quebec Hospitals. *Canadian Journal of Hospital Pharmacy* 65(6):428-435.

Cao, LY, Taylor, JS, Sood, A, Murray, D & Siegel, PD. 2010. Allergic contact dermatitis to synthetic rubber gloves: Changing Trends in patch test reactions to accelerators. *Arch Dermatol* 146(9):1001-1007.

Caruso, CC & Hitchcock, EM. 2010. Strategies for nurses to prevent sleep-related injuries and errors. *Rehabilitation Nursing* 35(5):192-197.

Casas, EC, Decroo, T, Mahoudo, JAB, Baltazar, JM, Dores, CD, Cumba, L, De Weggheleire, A, Huyst, V & Bottieau, E. 2011. Burden and outcome of HIV infection and other morbidities in health care workers attending an Occupational Health Program at the Hospital of Tete, Mozambique. *Tropical Medicine and International Health* 16(11):1450-1456.

Centers for Disease Control and Prevention. 2011a. Immunization of Health-Care Personnel Recommendations of the Advisory Committee on Immunization Practices (ACIP). *Morbidity and Mortality Weekly Report* 60(RR07):1-46. From: <http://www.cdc.gov/mmwr/pdf/rr/rr6007.pdf> (accessed 13 December 2013).

Centers for Disease Control and Prevention. 2011b. *Occupational HIV Transmission and Prevention among health care workers*.

From: <http://www.cdc.gov/hiv/resources/factsheets/PDF/hcw.pdf> (accessed 3 November 2015).

Chen, W-C, Huang, C-J, Hwang, J-S & Chen, C-C, 2010. The relationship of health-related quality of life to workplace physical violence against nurses by psychiatric patients. *Quality of Life Research* 19:1155–1161.

Chernovsky, MK, Sipe, JE & Ogle, RA. 2010. *Evaluation of Health care operating rooms as wet/dry locations*. Fire Research, Fire Protection Research Foundation.

From: www.nfpa.org/~media/files/news-and-research/.../rf_or_classification.pdf?la=en (accessed 3 November 2015).

Cho, E, Lee, H, Choi, M, Park, SH, Yoo, IY & Aiken, LH. 2012. Factors associated with needlestick and sharp injuries among hospital nurses: Across-sectional questionnaire survey. *International Journal of Nursing Studies* 50:1025-1032.

Claassens, MM, Sismanidis, C, Lawrence, K-A, Godfrey-Faussett, P, Ayles, H, Enarson, DA & Beyers, N. 2010. Tuberculosis among community-based health care researchers. *International Journal of Tuberculosis and Lung Disease* 14(12):1576-1581.

Clarke, PN & Brooks, B. 2010. Quality of nursing worklife: Conceptual clarity for the future. *Nursing Science Quarterly* 23(4):301-305.

COIDA see Compensation for Occupational Injuries and Diseases Act.

Compensation for Occupational Injuries and Diseases Act. 1993 (Act No.130 of 1993). Pretoria: Government Printer.

Coulliette, AD, Perry, KA, Edwards, JR & Noble-Wang, JA. 2013. Persistence of the 2009. Pandemic Influenza A (H1N1) Virus on N95 Respirators. *Applied and Environmental Microbiology* 79(7):2148-2155.

D’Arcy, LP, Sasai, Y & Stearns, SC. 2011. Do assistive devices, training, and workload affect injury incidence? Prevention efforts by nursing homes and back injuries among nursing assistants. *Journal of Advanced Nursing* 68(4):836-845.

Danzmann, L, Gastmeier, P, Schwab, F & Vonberg, R-F. 2013. Health care workers causing large nosocomial outbreaks: a systematic review. *BioMed Central Infectious Diseases* 13:98.

Daud-Gallotti, RM, Costa, SF, Guimaraães, T, Padilha, KG, Inoue, EN, Vasconcelos, TN, Rodrigues, FSC, Barbosa, EV, Figueiredo, WB & Levin, AS. 2012. Nursing workload as a risk factor for healthcare associated infections in ICU: A Prospective study. *PLoS ONE* 7(12):[1-6].

From: <http://journals.plos.org/plosone/article/asset?id=10.1371%2Fjournal.pone.0052342.pdf> (accessed 28 November 2014).

Davey, MM, Cummings, G, Newburn-Cook, CV & Lo, EA. 2009. Predictors of nurse absenteeism in hospitals: a systematic review. *Journal of Nursing Management* 17(3):312-330.

Democratic Nursing Organisation of South Africa. 2010. *DENOSA Gauteng*. From: www.denosa.org.za/Provinces.php?id=320 (accessed 06 September 2013).

Denis, A, Zelmar, A, Le Pogam, MA, Chaleat-Valayer, E, Bergeret, A & Colin, C. 2012. The PRESLO study: evaluation of a global secondary low back pain prevention program for health care personnel in a hospital setting. Multicenter, randomized intervention trial. *BMC Musculoskeletal Disorders* 13:234. From: <http://www.biomedcentral.com/1471-2474/13/234> (accessed 12 December 2013).

DENOSA see Democratic Nursing Organisation of South Africa.

Dény, P & Zoulim, F. 2010. Hepatitis B virus: From diagnosis to treatment. *Pathologie Biologie* 58(4):245-253.

Department of Health. 2011. *Strategy for the Health Sector: 2012/13 – 2016/17: Human Resources for Health South Africa*. Department of Health: South Africa. From: www.gov.za/sites/./hrh_strategy_0.pdf (accessed 1 September 2015).



Department of Health. 2012a. *National Strategic Plan on HIV, STIs and TB, 2012-2016*. Pretoria: Department of Health. From: www.health.gov.za/docs/strategic/2012/NSPfull.pdf (accessed 24 December 2014).

Department of Health. 2012b. *Policy on the management of public hospitals No. R186 in terms of National Health Act (Act 61 of 2003)*. Pretoria: Government Printers.

Department of Health. 2014a. *The National Health Promotion Policy and Strategy 2015-2019*. Department of Health.

From: www.health-e.org.za/wp-content/uploads/2015/09/The-National-Health-Promotion-Policy-and-Strategy.pdf (accessed 1 October 2015).

Department of Health. 2014b. *Strategic Plan 2014/15-2018/19*. Pretoria: Government Printers.

Deuffic-Burban, S, Delorocque-Astagneau, E, Abiteboul, D, Bouvet, E & Yazdanpanah, Y. 2011. Blood-borne viruses in health care workers: Prevention and management. *Journal of Clinical Virology* 52(1):4-10. From: www.elsevier.com/locate/jcv (accessed 9 December 2013).

Dharmadhikari, AS, Mphahlele, M, Stoltz, A, Venter, K, Mathebula, R, Masotla, T, Lubbe, W, Pagano, M, First, M, Jensen, PA, Van der Walt, M & Nardell, E. 2012. Surgical face masks worn by patients with Multidrug-Resistant Tuberculosis. *American Journal of Respiratory Critical Care Medicine* 185(10):1104-1109.

DollarSense. 2010. *How many hours will you work in your lifetime?* From: <http://www.whydowork.com/forums/how-many-hours-will-you-work-your-lifetime31203.html+time+spent+at+work+in+a+lifetime&cd=l&hl=en&ct=cln&ql=za> (accessed 09 July 2012).

Drebit, S, Shajari, S, Alamgir, H, Yu, S & Keen, D. 2010. Occupational and environmental risk factors for falls among workers in the healthcare. *Ergonomics* 53(4):525-536.

Drobnič, S, Beham, B & Präg, P. 2010. Good Job, Good Life? Working conditions and quality of life in Europe. *Social Indicators Research* 99(2):205-225.

Easton, S & Van Laar, D. 2012. *User Manual for the Work-Related Quality of Life (WRQoL) Scale: A measurement of quality of working life*. 1st edition. UK: University of Portsmouth. From: www.qowl.co.uk (accessed 14 March 2014).

Eidhammer, G, Flutttert, FAJ & Bjørkly, S. 2014. User involvement in structured violence risk management within forensic mental health facilities – A systematic literature review. *Journal of Clinical Nursing* 23(19-20):2716-2724.

Eljedi, A. 2015. Prevalence and response to occupational hazards among nursing students in Gaza Strip, Palestine: The Role of personal protective equipment and safety regulations. *Public Health Research* 5(1):32-38.

Ellis, P. 2013. *Understanding research for nursing students*. 2nd edition. London: SAGE.

Emergency Nurses Association. 2013. *Position statement: healthy work environment*. From: <https://www.ena.org/SiteCollectionDocuments/Position%20Statements/HEALTHYWORKENVIRONMENT.pdf> (accessed 6 June 2015).

Engelbrecht, MC, Yassi, A, Spiegel, JM, Van Rensburg, AJ, O'Hara, LM, Bryce, EA, Nophale, LE & Rau, A. 2015. Tuberculosis and blood-borne infectious diseases: workplace conditions and practices of healthcare workers at three public hospitals in the Free State. *South African Journal Infectious Diseases* 30(1):23-28.

Esmailpour, M, Salsali, M & Ahmadi, F. 2011. Workplace violence against Iranian nurses working in emergency departments. *International Nursing Review* 58(1):130-137.

Evans, DK, Goldstein, M & Popova, A. 2015 Health-care worker mortality and the legacy of the Ebola epidemic. *The Lancet* 3:e439-e440. From: [http://www.thelancet.com/journals/langlo/article/PIIS2214-109X\(15\)00065-0/fulltext?rss=yes](http://www.thelancet.com/journals/langlo/article/PIIS2214-109X(15)00065-0/fulltext?rss=yes) (accessed 11 January 2016).

Fagerström, L and Vainikainen, P. 2014. Nurses' experiences of nonpatient factors that affect nursing workload: A study of the PAONCIL Instrument's nonpatient factors. *Nursing Research and Practice* Article ID 167674: [1-9]. From: <http://dx.doi.org/10.1155/2014/167674> (accessed 3 November 2015).

Fain, JA. 2013. *Nursing research: Reading, understanding, and applying*. 4th edition. Philadelphia: FA Davis.

Feng, T-H & Liu, H-E. 2009. Initial evaluation of a new safety needle system at a clinical setting in Taiwan. *International Journal of Nursing Practice* 15(5):394-402.

Firnhaber, C, Reyneke, A, Schulze, D, Malope, B, Maskew, M, MacPhail, P, Sanne, I & Di Bisceglie, A. 2010. *The prevalence of hepatitis B co-infection in a South African urban government HIV clinic*. From: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3008405/pdf/nihms252674.pdf> (accessed 16 October 2016).

Fleck, SE. 2009. International comparisons of hours worked: an assessment of statistics. *Monthly Labor Review* 132:3-31.

Free Dictionary. 2011. From: www.thefreedictionary.com/act (accessed 02 April 2016).

Gale, NK, Heath, G, Cameron, E, Rashid, S & Redwood, S. 2013. Using the framework method for the analysis of qualitative data in multi-disciplinary health research. *BMC Medical Research Methodology* 13:117. From: <http://www.biomedcentral.com/1471-2288/13/117> (accessed 3 November 2015).

Galgalo, T, Dalal, S, Cain, KP, Oeltmann, J, Tetteh, C, Kamau, JG, Njenga, MK, Breiman, RF, Chakaya, JM, Irimu, HM, Miller, B, De Cock, KM, Bock, NN & Ijaz, K. 2008. Tuberculosis risk among staff of a large public hospital in Kenya. *International Journal of Tuberculosis and Lung Disease* 12(7):949-954.

Gayathiri, R & Ramakrishnan, L. 2013. Quality of work life – linkage with job satisfaction and performance. *International Journal of Business and Management Invention* 2(1):[1-8]. From: www.ijbmi.org (accessed 10 January 2015).

George, G, Gow, J & Bachoo, S. 2013. Understanding the factors influencing health-worker employment decisions in South Africa. *Human Resources for Health* 11:15. From: www.human-resources-health.biomedcentral.com/articles/10.1186/1478-4491-11-15 (accessed 3 November 2015).

Gerrish, K & Lathlean, J. 2015. *The research process in nursing*. 7th edition. West Sussex: John Wiley & Sons.

Glenngård, AH & Persson, U. 2009. Costs associated with sharps injuries in the Swedish health care setting and potential cost savings from needle-stick prevention devices with needle and syringe. *Scandinavian Journal of Infectious Diseases* 41(4):296-302.

GOHNET. 2013. *Improving workers' health worldwide: Implementing the WHO global plan of action on workers' health*. WHO: The Global Occupational Health Network Newsletter No. 21 June edition.

From: http://www.who.int/occupational_health/publications/newsletter/en/index.html (accessed 25 February 2014).

Gorman, T, Dropkin, J, Kamen, J, Nimbalkar, J, Zuckerman, N, Lowe, T, Szeinuk, J, Milek, D, Piligian, G & Freund, A. 2013. Controlling health hazards to hospital workers: A reference guide. *New Solution* 23 (Supplement):1-167.

From: http://new.sagepub.com/content/23/1_suppl/1.full.pdf+html (accessed 2 October 2014).

Grobler, CJ. 2013. Self-reported work-related musculoskeletal injuries and isometric handgrip strength. *Occupational Medicine* 63:210-216.

From: <http://occmed.oxfordjournals.org> (accessed 28 November 2014).

Grove, SK, Burns, N & Gray, JR. 2013. *The practice of nursing research: Appraisal, synthesis and generation of evidence*. 7th edition. Missouri: Elsevier Saunders.

Grove, SK, Gray, JR & Burns, N. 2015. *Understanding nursing research: Building an evidence-based practice*. 6th edition. Missouri: Elsevier Saunders.

Gupta, A. 2013. Quality of working life and organizational development. *Scientific Reports* 2(3):687. From: <http://doi:10.4172/scientificreports687> (accessed 10 January 2015).

He, GX, Wang, LX, Chai, SJ, Klena, JD, Cheng, SM, Ren, YL, Pen, LP, Gao, F, Li, YY, He, GM, Li, JB, Wang, Y, Rao, C & Varma, JK. 2012. Risk factors associated with Tuberculosis infection among health care workers in Inner Mongolia, China. *International Journal of Tuberculosis and Lung Disease* 16(11):1485-1491.

Health-e. 2013. *Tshwane district profile*. From: www.health-e-org.za/wp-content/uploads/2013/06/Tshwane-District-Profile.pdf (accessed 16.01.2014).

Health Systems Trust. 2013. *South African Health Review 2012/13*. Health Systems Trust: South Africa. From: <http://www.hst.org.za/publications/south-african-health-review-2012/13> (accessed 31 August 2015).

International Labour Office. 2005. *The nursing personnel convention, 1977 (C149) and the Nursing personnel recommendation, 1977 (R157)*. Geneva: International Labour Office. From: http://www.who.int/hrh/nursing_midwifery/nursing_convention_C149.pdf (accessed 1 November 2012).

ILO see International Labour Organization

International Labour Organization. 2007. *The Decent work agenda in Africa: 2007–2015*. Geneva: International Labour Office.
From: www.ilo.org/public/english/standards/relm/rgmeet/11afrm/dg-thematic.pdf (accessed 26 February 2014).

International Labour Organization. 2008. *Seoul declaration on safety and health*. ILO: Geneva. From: http://www.ilo.org/wcmsp5/groups/public/---ed_protect/---protrav/---safework/documents/meetingdocument/wcms_151736.pdf (accessed 10 November 2015).

International Labour Organization. 2010. Health care workers. *ILO African Newsletter on Occupational Health and Safety* 20(1):1-24.

From: http://www.ttl.fi/en/publications/electronic_journals/african_newsletter/Documents/african_newsletter1_2010.pdf (accessed 05 December 2015).

International Labour Organization. 2013. *The Prevention occupational diseases*. ILO: Geneva.

From: http://www.ilo.org/wcmsp5/groups/public/---ed_protect/---protrav/---safework/documents/publication/wcms_208226.pdf (accessed 10 November 2015).

Jayakumar, A & Kalaiselvi, K. 2012. Quality of work life – an overview. *International Journal of Marketing, Financial Services and Management Research* 1(10):140-151.

Jolley, J. 2013. *Introducing research and evidence-based practice for nursing and healthcare professionals*. 2nd edition. Essex: Pearson Education.

Julien, M, Somerville, K & Culp, N. 2011. Going beyond the work arrangement: the crucial role of supervisor support. *Public Administration Quarterly* 35(2):167-204.

Karani, H, Rangiah, S & Ross, AJ. 2011. Occupational exposure to blood-borne or body fluid pathogens among medical interns at Addington Hospital, Durban. *SA Family Practice* 53(5):462-466.

Kateera, F, Walker, TD, Mutesa, L, Mutabazi, V, Musabeyesu, E, Mukabatsinda, C, Bihizimana, CP, Kyamanywa, P, Karenzi, B & Orikiiriza, JT. 2015. Hepatitis B and C seroprevalence among health care workers in a tertiary hospital in Rwanda. *Trans Royal Society of Tropical Medicine and Hygiene* 109(3) 203-208.

Khawaja, RA, Sikander, R, Khawaja, AA, Jareno, RJM & Halepota, AT. 2012. Medically certified sickness absence among health care workers. *Journal of Pakistan Medical Association* 62:900-904.

Khawcharoenporn, T, Apisarnthanarak, A, Sungkanuparph, S, Woeltjie, KF & Fraser, VJ. 2011. Tuberculin skin test and isoniazid prophylaxis among health care workers in high

Tuberculosis prevalence areas. *International Journal of Tuberculosis and Lung Disease* 15(1):14-23.

Kleiner, S & Pavalko, EK. 2010. Clocking In: The organization of work time and health in the United States. *Social Forces* 88(3):1463-1486.

Knoeller, GE, Mazurek, JM & Moorman, JE. 2012. Health-related quality of life among adults with work-related asthma in the United States. *Quality of Life Research* 22:771-780.

Knutsson, A & Bøggild, H. 2010. Gastrointestinal disorders among shift workers. *Scandinavian Journal of Work, Environment and Health* 36(2):85-95.

Kolmos, HJ. 2012. Health care associated infections: sources and routes of transmission: *Infection Control – Updates*. Sudhakar, C. (Ed.). InTech.

From: <http://cdn.intechopen.com/pdfs-wm/28876.pdf> (accessed 3 November 2015).

Kopp, B, Schierl, R & Nowak, D. 2013. Evaluation of working practices and surface contamination with antineoplastic drugs in outpatient oncology health care settings. *International Archives of Occupational and Environmental Health* 86(1):47-55.

Kowalenko, T, Cunningham, R, Sachs, CJ, Gore, R, Barata, IA, Gates, D, Hargarten, SW, Josephson, EB, Kamat, S, Kerr, HD & McClain, A. 2012. Violence: Recognition, management and prevention. Workplace violence in emergency medicine: current knowledge and future directions. *Journal of Emergency Medicine* 43(3):523-531.

Kruger, WH. 2012. Health and safety representatives' perceptions and experiences in an academic hospital: appointment and relationships. *Occupational Health Southern Africa* 18(4):20-24.

Kruger, WH, Jimoh, SO & Joubert, G. 2012. Needlestick injuries among nurses in a regional hospital in South Africa. *Occupational Health Southern Africa* 18(3):4-10.

Kuchařová, V. 2009. Work-life balance: Societal and private influences. *Czech Sociological Review* 45(6):1283-1310.

Kuehn, MB. 2010. Creating a healthy work environment for nursing faculty. *Creative Nursing* 16(4):193-197.

Kuhar, DT, Henderson, DK, Struble, KA Heneine, W, Thomas, V, Cheever, LW, Gomaa, A & Panlilio, AL. 2013. Updated US public health service guidelines for the management of occupational exposures to human immunodeficiency virus and recommendations for post exposure prophylaxis. *Infection Control and Hospital Epidemiology* 34(9):875-892.

Laramie, AK, Pun, VC, Fang, SC, Kriebel, D & Davis, L. 2011. Sharps injuries among employees of acute care hospitals in Massachusetts, 2002-2007. *Infection Control and Hospital Epidemiology* 32(6):538-544.

Lautizi, M, Laschinger, HKS & Ravazzolo, S. 2009. Workplace empowerment, job satisfaction and job stress among Italian mental health nurses: an exploratory study. *Journal of Nursing Management* 17(4):446-452.

Lee, K, Han, MK, Choi, HR, Choi, CM, Oh, YM, Lee, SD, Kim, WS, Kim, DS, Woo, JH & Shim, TS. 2009. Annual incidence of latent Tuberculosis infection among newly employed nurses at a Tertiary Care University Hospital. *Infection Control and Hospital Epidemiology* 30(12):1218-1222.

Lenthal, S, Wakerman, J, Opie, T, Dollard, M, Dunn, S, Knight, S, MacLeod, M & Watson, C. 2009. What stresses remote area nurses? Current knowledge and future action. *The Australian Journal of Rural Health* 17(4):208-213.

Lim, HJ, Black, TR, Shah, SM, Sarker, S & Metcalfe, J. 2011. Evaluating repeated patient handling injuries following the implementation of a multi-factor ergonomic intervention program among health care workers. *Journal of Safety Research* 42(3):185-191.

Lipscomb, J, Sokas, R, McPhaul, K, Scharf, B, Barker, P, Trinkoff, A & Storr, C. 2009. Occupational blood exposure among unlicensed home care workers and home care registered nurses: Are they protected? *American Journal of Industrial Medicine* 52(7):563-570.

LoBiondo-Wood, G & Haber, J. 2014. *Nursing research: Methods and critical appraisal for evidence-based practice*. 8th edition. Missouri: Elsevier Mosby.

Lombardi, DA, Verna, SK, Brennan, MJ & Perry, MJ. 2009. Factors influencing worker use of personal protective eyewear. *Accident Analysis and Prevention* 41(4):755-762.

Lunt, JA, Sheffield, D, Bell, N, Bennett, V & Morris, LA. 2011. Review of preventative behavioural interventions for dermal and respiratory hazards. *Occupational Medicine* 61:311-320. From: <http://occmmed.oxfordjournals.org> (accessed 28 November 2014).

Magnavita, N. 2013. The exploding spark: Workplace Violence in an infectious disease hospital - a longitudinal study. *BioMed Research International*, Article ID316358: [1-9]. From: <http://dx.doi.org/10.1155/2013/316358> (accessed 16 April 2016).

Magnavita, N & Heponiemi, T. 2012. Violence towards health care workers in a public health care facility in Italy: A repeated cross-sectional study. *BioMed Central Health Services Research* 12:108. From: <http://www.biomedcentral.com/1472-6963/12/108> (accessed 16 April 2016).

Magnavita, N, Elovainio, M, De Nardis, I, Heponiemi, T & Bergamaschi, A. 2011. Environmental discomfort and musculoskeletal disorders. *Occupational Medicine* 61:196-201. From: www.doi:10.1093/occmmed/kqr024 (16 April 2016).

Maltezou, HC, Wicker, S, Borg, M, Heininger, U, Puro, V, Theodoridou, M & Poland, GA. 2011. Vaccination policies for health care workers in acute health-care facilities in Europe. *Vaccine* 29:9557-9562. From: www.elsevier.com/locate/vaccine (accessed 5 December 2013).

Manitoba. 2012. *Routine practices and additional precautions: Preventing the transmission of infection in health care*. Manitoba.
From: <https://www.gov.mb.ca/health/publichealth/cdc/docs/ipc/rpap.pdf> (accessed 10 January 2014).

Mathewos, B, Birhan, W, Kinfe, S, Boru, M, Tiruneh, G, Addis, Z & Alemu, A. 2013. Assessment of knowledge, attitude and practice towards post exposure prophylaxis for HIV among health care workers in Gondar, North West Ethiopia. *Public Health* 13:508. From: <http://www.biomedcentral.com/1471-2458/13/508> (accessed 9 December 2013).

McClelland, LE, Switzer, FS, III & Pilcher, JJ. 2013. Changes in nurses' decision making during a 12-h day shift. *Occupational Medicine* 63:60-65. From: <http://occm.oxfordjournals.org> (accessed (28 November 2014).

McDiarmid, MA. 2014. Hazards of the Health care sector: Looking beyond infectious disease. *Annals of Global Health* 80(4):315-319.

McHugh, MD, Kutney-Lee, A, Cimiotti, JP, Sloane, DM & Aiken, LH. 2011. Nurses' widespread job dissatisfaction, burnout, and frustration with health benefits signal problems for patient care. *Health Affairs* 30(2):202-210.

Mchunu, G. 2012. Proposed guidelines for a workplace health promotion policy and implementation framework. *Occupational Health Southern Africa* 18(2):5-12.

Michel, L-M & Tiollais, P. 2010. Hepatitis B vaccines: Protective efficacy and therapeutic potential. *Pathologie Biologie* 58(4):288-295.

Milton, CL. 2010. Quality of work life for nurses: An ethical perspective. *Nursing Science Quarterly* 23(4):287-289.

Mogale, NM, Malangu, N & Huma, M. 2014. Occurrence of occupational slips, trips and falls amongst health workers in Limpopo Province of South Africa. *PULA: Botswana Journal of African Studies* 28(1):72-80.

Mosendane, T, Kew, MC, Osih, R & Mahomed, A. 2012. Nurses at risk for occupationally acquired blood-borne virus infection at a South African academic hospital. *South African Medical Journal* 102(3):153-156.

Munhall, PL. 2012. *Nursing research: A qualitative perspective*. 5th edition. Ontario: Jones & Bartlett Learning.



Nabe-Nielsen, K, Tüchsen, F, Christensen, KB, Garde, AH & Diderichsen, F. 2009. Differences between day and nonday workers in exposure to physical and psychosocial work factors in the Danish eldercare sector. *Scandinavian Journal of Work, Environment and Health* 35(1):48-55.

Nagendran, V, Wicking, J, Ekbote, A, Onyekwe, T & Garvey, LH. 2009. IgE-mediated chlorhexidine allergy: a new occupational hazard? *Occupational Medicine* 59(4):270-272.

Naidoo, S, Seevnrain, K & Nordstrom, DL. 2012. Tuberculosis infection control in primary health clinics in eThekweni, KwaZulu-Natal, South Africa. *International Journal of Tuberculosis and Lung Disease* 16(12): 1600-1604.

NHA see National Health Act.

National Health Act. 2003. *Act No. 61 of 2003*. Pretoria: Government Printer.

Ndejjo, R, Musinguzi, G, Yu, X, Buregyeya, E, Musoke, D, Wang, J-S, Halage, AA Whalen, C, Bazeyo, W, Williams, P & Ssempebwa, J. 2015. Occupational Health Hazards among Healthcare Workers in Kampala, Uganda. *Journal of Environmental and Public Health* 2015:[1-9]. From: <http://dx.doi.org/10.1155/2015/913741> (accessed 10 January 2016).

Needham, I, Kingma, M, McKenna, K, Frank, O, Tuttas, C, Kingma, S & Oud, N. 2014. *Violence in the Health Sector*. Fourth International Conference on violence in the health sector towards safety, security and wellbeing for all. Amsterdam: Kavannah.

Neill, D. 2011. Nursing workload and the changing health care environment: A review of the literature. *Administrative Issues Journal: Education, Practice and Research* 1(2):132-143.

NHA see National Health Act.

NIOSH. 2008. *Use of blunt-tip suture needles to decrease percutaneous injuries to surgical personnel*. Centres for Disease Control and Prevention. From: <http://www.cdc.gov/niosh/docs/2008-101/pdfs/2008-101.pdf> (accessed 3 November 2015).

NIOSH. 2009. *Environmental control for tuberculosis: Basic upper-room ultraviolet germicidal irradiation guidelines for healthcare settings*. Centres for Disease Control and Prevention.

From: <http://www.cdc.gov/niosh/docs/2009-105/pdfs/2009-105.pdf> (accessed 3 November 2015).

NIOSH. 2015. *Considerations for selecting protective clothing used in healthcare for protection against microorganisms in blood and body fluids*. Centres for Disease Control and Prevention - NPPTL. From: <http://www.cdc.gov/niosh/npptl/topics/protectiveclothing/> (accessed 3 November 2015).

Nukui, Y, Hatakeyama, S, Kitazawa, T, Mahira, T, Shintani, Y & Moriya, K. 2012. Pandemic 2009 Influenza A (H1N1) Virus among Japanese healthcare workers: Seroprevalence and risk factors. *Infection Control and Hospital Epidemiology* 33(1):58-62.

Occupational Health and Safety Act (OHSA). 1993a. (Act No. 85 of 1993) as amended. Pretoria: Government Printer.

Occupational Health and Safety Amendment Act. 1993b. (Act No 181 of 1993). Pretoria: Government Printer.

Okosun, KO. 2014. Impact and optimal control of movement on a multipatch hepatitis C virus model. *Journal of Pure and Applied Mathematics* 5(1):80-89.

Padayatchi, N, Daftary, A, Moodley, T, Madansein, R & Ramjee, A. 2010. Case series of long-term psychosocial impact of drug-resistant Tuberculosis in HIV-negative medical doctors. *International Journal of Tuberculosis and Lung Disease* 14(8):960-966.

Parahoo, K. 2014. *Nursing research: Principles, process and issues*, 3rd edition. Hampshire: Palgrave MacMillan.

Patel, P, Davis, S, Tolle, M, Mabikwa, V & Anabwani, G. 2011. Prevalence of Hepatitis B and Hepatitis C Coinfections in an Adult HIV Centre Population in Gaborone, Botswana. *American Journal of Tropical Medicine and Hygiene* 85(2): 390-394.

Phaswana, SM & Naidoo, S. 2013. The prevalence of latex sensitisation and allergy and associated risk factors among healthcare workers using hypoallergenic latex gloves at King Edward VIII Hospital, KwaZulu-Natal South Africa: a cross-sectional study. *BMJ Open* 3(12): [1-10]. From: <http://bmjopen.bmj.com/> (accessed 16 April 2016).

Pretty, JR, Connor, TH, Spasojevic, I, Kurtz, KS, McLaurin, JL, B'Hymer, C & Debord, DG. 2010. Sampling and mass spectrometric analytical methods for five antineoplastic drugs in the healthcare environment. *Journal of Oncology Pharmacy Practice* 18(1):23-36.

Questia. 2012. *Feminist psychology*. From: www.questia.com/library/sociology-and-anthropology/gender/women/feminism/feminist-psychology (accessed 26.10.2012).

Regulations for Hazardous Biological Agents. 2001. No. R1390, in terms of the Occupational Health and Safety Act, 1993 (Act 85 of 1993). Pretoria: Government Printer.

Regulations relating to categories of hospitals. 2012. No. R185 in terms of the National Health Act, 2003 (Act 61 of 2003). Pretoria: Government Printer.

Rim, K-T & Lim, C-H. 2014. Biologically hazardous agents at work and efforts to protect workers' health: A review of recent reports. *Safety and Health at Work* 5(2):43-52. From: www.ncbi.nlm.nih.gov/pmc/articles/PMC4147232/pdf/main.pdf (accessed 3 November 2015).

Rodriguez-Acosta, RL, Richardson, DB, Lipscomb, HJ, Chen, JC, Dement, JM, Myers, DJ & Loomis, DP. 2009. Occupational injuries among aides and nurses in acute care. *American Journal of Industrial Medicine* 52(12):953-964.

Rose, A & Rees, D. 2014. The impact of contact dermatitis: a case series from the National Institute for Occupational Health (NIOH). *Occupational Health Southern Africa* 20(2):11-17.

Royuela, V, López-Tamayo, J & Suriñach, J. 2009. Results of a quality of work life index in Spain: A comparison of survey results and aggregate social indicators. *Social Indicators Research* 90(2):225-241.

Salihu, HM, Myers, J & August, EM. 2012. Pregnancy in the workplace. *Occupational Medicine* 62(2):88-97. From: <http://occmmed.oxfordjournals.org> (accessed 9 August 2014).

Schoenfisch, AL & Lipscomb, HJ. 2009. Job characteristics and work organization factors associated with patient-handling injury among nursing personnel. *Work* 33(4):117-128.

Schutt, RK. 2012. *Investigating the social world: the process and practice of research* 7th edition. Los Angeles: Sage.

Seale, H, Kaur, R & Macintyre, CR. 2012. Understanding Australian healthcare workers' uptake of influenza vaccination: examination of public hospital policies and procedures. *Health Services Research* 12:325.

From: <http://bmchealthservres.biomedcentral.com/articles/10.1186/1472-6963-12-325> (accessed 11 September 2015).

Sehume, O, Zungu, L & Hoque, M. 2012. Attitudes and willingness of nursing students towards caring for patients infected with HIV in South Africa *Ife Psychologia* 20(2):12-20.

Siegel, JD, Rhinehart, E, Jackson, M & Chiarello, L. 2007. *2007 Guideline for Isolation precautions: Preventing transmission of infectious agents in healthcare settings*. Centres for Disease Control and Prevention.

From: <http://www.cdc.gov/hicpac/pdf/isolation/Isolation2007.pdf> (accessed 3 November 2015).

Singh, TS & Matuka, O. 2013. Work-related infections – Part 1: Risks of exposure to infectious agents in the workplace. *Occupational Health Southern Africa* 19(2):4-12. From: <http://www.occhealth.co.za/?/viewArticle/1414> (accessed 10 November 2015).

Sinha, C. 2012. Factors affecting quality of work life: Empirical evidence from Indian organizations. *Australian Journal of Business and Management Research* 1(11):31-40.

Skodric-Trifunovic, V, Markovic-Denic, L, Nagorni-Obradovic, L, Vlajinac, H & Woeltjie, KF. 2009. The risk of occupational Tuberculosis in Serbian health care workers. *International Journal of Tuberculosis and Lung Disease* 13(5):640-644.

Smith, LM, Andrusyszyn, MA & Laschinger, HKS. 2010. Effects of workplace incivility and empowerment on newly-graduated nurses' organisational commitment. *Journal of Nursing Management* 18(1):1004-1015. .

Speechley, M. 2011. Knowledge translation for falls prevention: The view from Canada. *Journal of Safety Research* 42(6):453-459.

Spence-Laschinger, HK. 2010. Positive working relationships matter for better nurse and patient outcomes. *Journal of Nursing Management* 18(8):875-877.

Spence-Laschinger, HK, Leiter, M, Day, A & Gilin, D. 2009. Workplace empowerment, incivility, and burnout: impact on staff nurse recruitment and retention outcomes. *Journal of Nursing Management* 17(3):302-311.

Stephen, A & Dhanapal, D. 2011. Quality of work life and its impact on organisational excellence in small scale industrial units: Employers' perspectives. *Journal of Contemporary Management Research* 5(2):55-67.

Stimpfel, AW, Sloane, DM, & Aiken, LH. 2012. The longer the shifts for hospital nurses, the higher the levels of burnout and patient dissatisfaction. *Health Affairs* 31(11):2501-2509.

Sydnor, ER & Perl, TM. 2011. Hospital epidemiology and infection control in acute-care settings. *Clinical Microbiology Reviews* 24(1):141-173.

Takahashi, M, Iwakiri, K, Sotoyama, M, Hirata, M & Hisanaga, N. 2009. Musculoskeletal pain and night-shift naps in nursing home care workers. *Occupational Medicine* 59(3):197-200. From: <http://occmed.oxfordjournals.org> (accessed 28 November 2014).

Takala, J, Hamalainen, P, Saarela, KL, Yun, LY, Manickam, K, Jin, TW, Heng, P, Tjong, C, Kheng, LG, Lim, S & Lin, GS. 2014. Global estimates of the burden of injury and illness at work in 2012. *Journal of Occupational and Environmental Hygiene* 11(5):326-337. From: www.ncbi.nlm.gov/pubmed/24219404 (accessed 10 November 2015).

Tosini, W, Ciotti, C, Goyer, F, Lolom, I, L'Hériveau, F, Abiteboul, D, Pellissier, G & Bouvet, E. 2010. Needle stick injury rates according to different types of safety-engineered-devices: Results of a French Multicenter study. *Infection Control and Hospital Epidemiology* 31(4):402-407.

Totman, J, Lewando Hundt, G, Wearn, E, Paul, M & Johnson, S. 2011. Factors affecting staff morale on inpatient mental health wards in England: A qualitative investigation. *BioMed Central Psychiatry* 11:68.

Treakle, AM, Schultz, M, Giannakos, GP, Joyce, PC & Gordin, FM. 2011. Evaluating a decade of exposures to blood and body fluids in an Inner-City Teaching Hospital. *Infection Control and Hospital Epidemiology* 32(9):903-907. From: <http://www.jstor.org> (accessed 6 December 2013).

Tsagris, V, Nika, A, Kyriakou, D, Kapetanakis, I, Harahousou, E, Stripeli, F, Maltezou, H & Tsolia, M. 2012. Influenza A/H1N1/2009 outbreak in a neonatal intensive care unit. *Journal of Hospital Infection* 81(1):36-40.

Tshitangano, TG. 2013. The management of latent tuberculosis infection in health care workers at hospitals in Vhembe district. *Occupational Health Southern Africa* 19(5):14-19.

Tullar, JM, Brewer, S, Amick III, BC, Irvin, E, Mahood, Q, Pompeii, LA, Wang, A, Van Eerd, D, Gimeno, D & Evanoff, B. 2010. Occupational safety and health interventions to reduce musculoskeletal symptoms in the health care sector. *Journal of Occupational Rehabilitation* 20(2):199-219.

Utriainen, K & Kyngas, H. 2009. Hospital nurses' job satisfaction: a literature review. *Journal of Nursing Management* 17(8):1002-1010.

Vanhems, P, Voirin, N, Roche, S, Escuret, V, Regis, C, Gorain, C, Pires-Cronenberger, S, Giard, M, Lina, B, Najjioullah, F, Barret, B, Pollissard, L, David, S, Crozet, MN, Comte, B, Hirschel, B & Ecohard, R. 2011. Risk of Influenza-Like Illness in an acute health care setting during community Influenza epidemics in 2004-2005, 2005-2006, 2006-2007. *Archives of Internal Medicine* 171(2):151-157.

Vroege, L, Hoedeman, R, Nuyen, J, Sijtsma, K & Feltz-Cornelis, C. 2012. Validation of the PHQ-15 for Somatoform disorder in the occupational health care setting. *Journal of Occupational Rehabilitation* 22(1):51-58.

Wachter, JK & Yorio, PL. 2013. A system of safety management practices and worker engagement for reducing and preventing accidents: An empirical and theoretical investigation. *Accident Analysis and Prevention* 68:117-130

From: <http://dx.doi.org/10.1016/j.aap.2013.07.029> (accessed 03 December 2013).

Walker, LJ. 2010. *PPE for women*. International Safety Equipment Association. From: http://ehstoday.com/images/ISEA_April.pdf (accessed 26 February 2014).

Warnakulasuriya, SSP, Peiris-John, RJ, Coggon, D, Ntani, G, Sathiakumar, N & Wickremasinghe, AR. 2012. Musculoskeletal pain in four occupational populations in Sri Lanka. *Occupational Medicine* 62:269-272. From: <http://occmed.oxfordjournals.org/> (accessed at UNISA 11 June 2012).

WHO see World Health Organization.

Wisetborisut, A, Angkurawaranon, C, Jiraporncharoen, W, Uaphanthasath, R & Wiwatanadate, P. 2014. Shift work and burnout among health care workers. *Occupational Medicine* 64(4):279-286.

Wong, IS, McLeod, CB & Demers, PA. 2011. Shift work trends and risk of work injury among Canadian workers. *Scandinavian Journal of Work, Environment and Health* 37(1):54-61.

World Health Organization. 2012. *Global Conference: Connecting Health and labour: bringing together occupational health and primary care to improve the health of working people*. The Hague, the Netherlands, 29 November – 1 December 2011. From: www.who.int/hrh/documents/21may2015_web_final.pdf (accessed 11 January 2016).

World Health Organization. 2015. *Use of high burden country lists for TB by WHO in the post-2015 era*. Geneva: World Health Organization. From: http://www.who.int/tb/publications/global_report/high_tb_burden_country_lists_2016-2020_summary.pdf (accessed 14 May 2016).

World Health Report. 2006. Health care workers: A global profile. WHO: Geneva. From: http://www.who.int/whr/2006/06_chap1_en.pdf (accessed 3 November 2015).

Zungu, LI. 2012. Occupational health and safety challenges reported by women in selected South African gold and platinum mines. *Occupational Health Southern Africa* 18(5):6-13.

Zungu, LI & Sanni, BA. 2011. Acceptance and uptake of voluntary HIV testing among healthcare workers in a South African public hospital. *South African Family Practice* 53(5):488-494.

Zungu, M & Malotle, M. 2011. Do we know enough to prevent occupationally acquired tuberculosis in healthcare workers? *Occupational Health Southern Africa* 17(5):17-21.

ANNEXURES

ANNEXURE A

Request to conduct research

ANNEXURE A

To: The Head of Policy, Research and Planning Committee Gauteng Province
Provincial Department of health: Gauteng Province

From: Ms OMM Sehume - Lecturer Vaal University of Technology

Date: 03. 02. 2014

Subject: **REQUEST TO COLLECT DATA FROM NURSES IN ALL NURSING CATEGORIES IN THE TSHWANE HEALTHCARE DISTRICT, FOR RESEARCH PURPOSES.**

Background

Occupational health and safety is a global concern due to health associated risks and hazards that health care workers are faced with. The wellbeing of health care workers in public hospitals is a cause for concern as they face work-related diseases and injuries, exacerbated by inadequate structural and material resources. The study will explore and describe the prevailing OHS circumstances under which HCW's work; and provide information pertaining to supporting OHS records and documents which will be reviewed in retrospect. The aim of this study is to develop guidelines to promote the occupational health and safety of HCWs in selected public hospitals in the Tshwane healthcare district.

Discussion

I am a lecturer at Vaal University of Technology pursuing a Doctoral degree in Health Studies. My research topic is: Evidence-based guidelines to promote the health and safety of health care workers in selected public hospitals in the Tshwane Healthcare District in Gauteng, South Africa. I am requesting to collect data from the nurses of all categories in the hospitals mentioned below. Due to financial constraints, the data will be collected from non-specialised public hospitals in Tshwane healthcare district i.e. George Mukhari, Steve Biko, Kalafong, Pretoria West, Tshwane district hospital, Mamelodi, Odi and Jubilee hospitals. I have attached a copy of my research proposal and the ethical clearance certificate from my institution. Workers will be provided with a questionnaire which they will fill in, out of free will. No prospective participant will be intimidated or

coerced into taking part. Occupational health and safety records will be reviewed using a checklist.

Financial implications

The Department is not expected to incur any costs. All financial implications will be incurred by the researcher.

Thank you.

Ms OMM Sehume (Lecturer: Vaal University of Technology).

ANNEXURE B

Approval to conduct research



OUTCOME OF PROVINCIAL PROTOCOL REVIEW COMMITTEE (PPRC)

Researcher's Name (Principal investigator)	OMM Sehume
Organization / Institution	UNISA
Research Title	Enhancing the quality of work life among female health care workers
Protocol number	P150214
Date submitted	03/02/2014
Date reviewed	19/02/2014
Outcome	APPROVED
Date resubmitted	N/A
Date of second review	N/A
Final outcome	N/A

It is a pleasure to inform that the Gauteng Health Department has approved your research on "Enhancing the quality of work life among female health care workers".

The Provincial Protocol Review Committee kindly requests that you to submit a report after completion of your study and present your findings to the Gauteng Health Department.

Approves / not approves

[Handwritten signature]

Dr Bridget Ikalafeng
Provincial Protocol Review Committee, Chairperson
 Date 10/03/2014



UNIVERSITEIT VAN PRETORIA
UNIVERSITY OF PRETORIA
YUNIBESITHI YA PRETORIA

Faculty of Health Sciences Research Ethics Committee
DATE: 30/04/2014

Monica Sehume
UNISA PhD student,

Dear Monica Sehume

RE.: ENHANCING THE QUALITY OF WORK LIFE AMONG FEMALE HEALTH CARE WORKERS IN SELECTED PUBLIC HOSPITALS IN TSHWANE HEALTH CARE DISTRICT IN GAUTENG PROVINCE.

We are referring to your e-mail dated 2014/04/25 regarding ethical permission.

The Faculty of Health Sciences Research Ethics Committee, University of Pretoria notes that you have already obtained ethics approval from:

1. Ethics Committee of UNISA being the Higher Degrees Committee of the Department of Health Studies.
2. Ethics Committee of the Department of Health (Gauteng Province) since the research is focused on government hospitals in Tshwane.
3. Research Committee of the Tshwane Health District.

We hereby confirm that the Research Ethics Committee of the Faculty of Health Sciences has taken note of your research protocol and does not have any ethical concerns regarding you accessing Steve Biko Academic Hospital and its employees for your project, provided you obtain the informed consent of all the participants in your study, and provided you obtain the permission of the hospital authorities prior to you conducting your study at Steve Biko Academic Hospital.

Herewith permission for your request to use health care workers at SBAH and we wish you the best with your research.

With regards

A handwritten signature in black ink, appearing to read 'R Sommers'.

Dr R Sommers; MBChB; MMed (Int); MPharMed.

Deputy Chairperson of the Faculty of Health Sciences Research Ethics Committee, University of Pretoria

Tel :012-3541330 □ Fax:012-3541367 / 0866515924 □ E-Mail: fhsethics@up.ac.za

Web: //www.healthethics-up.co.za □ H W Snyman Bld (South) Level 2-34 □ Private Bag x 323, Arcadia, Pta, S.A., 0007

ANNEXURE C

Clearance Certificate from the University of South Africa



**UNIVERSITY OF SOUTH AFRICA
Health Studies Higher Degrees Committee
College of Human Sciences
ETHICAL CLEARANCE CERTIFICATE**

HS HDC/293/2013

Date: 15 January 2014 Student No: 3047-192-3
Project Title: Enhancing the quality of work life among female health care workers in selected public hospitals in Tshwane health care district in Gauteng Province.
Researcher: Sehume Odilla Monica Mamane
Degree: D Litt et Phil Code: DPCHS04
Supervisor: Prof LI Zungu
Qualification: PhD
Joint Supervisor: Prof K Jooste

DECISION OF COMMITTEE

Approved Conditionally Approved

**Prof L Roets
CHAIRPERSON: HEALTH STUDIES HIGHER DEGREES COMMITTEE**

**Prof MM Moleki
ACADEMIC CHAIRPERSON: DEPARTMENT OF HEALTH STUDIES**

PLEASE QUOTE THE PROJECT NUMBER IN ALL ENQUIRES

ANNEXURE D

LETTER TO PARTICIPANTS TO GET VERBAL PERMISSION

PARTICIPANT CONSENT

EVIDENCE-BASED GUIDELINES TO PROMOTE THE HEALTH AND SAFETY OF HEALTH CARE WORKERS IN SELECTED PUBLIC HOSPITALS IN THE TSHWANE HEALTHCARE DISTRICT IN GAUTENG, SOUTH AFRICA

I am a Professional nurse and a lecturer by occupation working for the Vaal University of Technology. I am conducting a study which is aimed at promoting occupational health and safety among health care workers employed in the public health sector in South Africa. The study is limited to Gauteng Province due to resource constraints. The focus will be put on the Tshwane healthcare district public hospitals. Recommendations will be made based on the outcome of the study. The study aims to recommend ways to improve the well-being of HCWs in the health care workplace.

Participation is voluntary and any one is free to withdraw from the study at any given time. Non-participation and withdrawal will affect nobody negatively. Responses will not be identifiable. Confidentiality of the raw data will be ensured and publication of the research results will be based on aggregate information.

I agree to participate in this study: Yes No

Date: -----

Signature of participant-----

Your participation is highly appreciated

ANNEXURE E

THE SELF-ADMINISTERED QUESTIONNAIRE

SELF-ADMINISTERED QUESTIONNAIRE

1. DEMOGRAPHIC DATA

Please mark the appropriate box with an X

Q1. Age group

< 20	
20-29	
30-39	
40-49	
50-59	
60+	

Q2. Marital status:

Single		Divorced	
Engaged		Widowed	
Married		Living together	

Q3. Race

White		Coloured		Black	
Indian		Other (specify) -----			

Q4. Nursing category

Professional Nurse		Nurse Manager	
Enrolled Nurse		Auxiliary Nurse	
Student Nurse			

Q5. Type of hospital

Central hospital	
Regional hospital	
District hospital	

Q6. Type of unit

Medical		OPD	
Surgical		Theatre	
Maternity		Paediatric	
Casualty		Wellness	
Other (Specify) _____			

Q7. Years of experience in the unit:

1-3 years	4-6 years	7-9years	10years +
-----------	-----------	----------	-----------

Q8. Years of experience in the health industry

0 – 9 years	
10 – 19 years	
20 – 29 years	
30 – 39 years	
40 + years	

EXPOSURE TO WORKPLACE HAZARDS

Biological Hazards: _

Q9. Have you experienced a needle stick injury at work in the previous 12 months?

YES NO

If yes, briefly explain how the incident occurred?

Q10. Have you experienced negligent disposal of used needles

YES NO

If yes, what do you attribute the problem to: (in your experience)

	YES	NO
Lack of disposal bins		
Insufficient disposal bins		
Lack of staff training		
Staff attitudes		
Other		

Q11. Have you experienced splashes from patients' blood or other body fluids in the previous 12 months?

YES NO

If yes, briefly explain how the incident occurred?

Q12. Are you in constant exposure to biological agents in your unit? (E.g. Hepatitis C virus; Hepatitis B virus; HIV; Mycobacterium Tuberculosis, etc.).

YES NO

Q13. Are you in constant contact with medical waste?

YES NO

Q14. Are medical waste disposal methods used in your organisation effective?

YES NO

If no, how could they be improved?

Q15. Have you had accidental exposure to hazardous drugs, e.g. chemotherapy drugs in the last 12 months?

YES NO

If yes, what was the effect of the exposure on your body/health?

Q16. Did you at any time experience unwanted reactions from the use of latex gloves in the past 12months?

YES NO

If yes, what provision was made to ensure protection against contamination with infectious agents?

Psychosocial Hazards

Q17. Do you experience work related stress in relation to: e.g. long hours of work, shift work, increased workloads, insufficient rest periods, workplace violence or any other stressor)

YES NO

If yes, briefly describe the stressor(s)

Q18. Do you experience long hours of work?

YES NO

If yes, how many hours do you work per week?

Q19. Do you experience work-related stress in relation to shift work?

YES NO

If yes, how is shift work stressful to you?

Q20 Do you feel shift work is well structured to suit your psychosocial wellbeing?

YES NO

If no, please explain.

Q21. Did you experience workplace violence in the past 12 months? _____
YES NO

(i) Who was the perpetrator of the violence?

Staff-to-patient	
Patient-to-staff	
Staff-to-staff	
Patient family member-to-staff	
Patient-to-patient	
Staff- to – patient family member	

(ii) What was the nature of the violence?

Physical attack with a weapon	
Assault	
Verbal attack	
Other.....	
.....	
.....	

Q22. Which of the following stresses you the most? (**Mark only one box**)

Long hours of work	
Shift work	
Increased workloads	
Insufficient rest periods	
Workplace violence	

WORK-RELATED INJURIES / DISEASES

Q23. Have you suffered any work related injuries in the previous 12 months in your current employment?

YES NO

If yes, briefly explain (type of injury and intervention taken by your current employer in the past 12 months)

Q24. Have you contracted any occupationally acquired disease in the previous 12 months in your current employment?

YES NO

If yes, briefly explain (type of disease and intervention taken by your employer in the past 12 months)

Q25. Did you sustain any musculo-skeletal injury at work, e.g. backache, in the past 12 months?

YES NO

If yes, what type of musculo-skeletal injury did you sustain at work in the previous 12 months?

Chronic medication

Q26. Are you on any chronic medication for a work-related injury or disease?

YES NO

If yes, please indicate for which injury/disease.

MEDICAL SURVEILLANCE

Q27. Did you undergo medical screening upon your appointment?

YES NO

If yes, please indicate which diseases were you screened for.

Q28. Do you undergo periodic medical assessment at work?

YES NO

If yes, at what intervals are the assessments?

Q29. Upon rotation from one unit to the other, do you undergo medical screening?

YES NO

If yes, for which conditions are you screened?

WORKPLACE SAFETY

Q30. Do you receive training related to hazards in your work?

YES NO

Q31. Are you provided with the necessary personal protective equipment (PPE) needed in the performance of your duties? (E.g. gowns, masks, gloves, caps, glasses, etc.)

YES NO

Q32. Do you get training on the use of personal protective equipment (PPE)?

YES NO

Q33. Are safety inspections periodically done in your unit?

YES NO

If yes, please indicate the following.

(i) Who conducts the inspections?

(ii) Do you receive feedback on the outcome of the inspections?

YES NO

Q34. Would you say there is managerial commitment and support to enhance the health and safety of workers in your institution or unit?

YES NO

If no, explain briefly

WORKER PERSPECTIVES ON HEALTH AND SAFETY PROMOTION

Q35. What is your opinion about the health and safety of health care workers (HCWs) in the health care industry?

Q36. How can the health and safety needs of HCWs in public hospitals be addressed to promote their well-being at work?

THANK YOU FOR PARTICIPATING IN THE STUDY!!!

ANNEXURE E

Part A: Checklist for inspection of OHS policy compliance

ANNEXURE E

Part A: Checklist for inspection of OHS policy compliance

Please mark the appropriate box with "X"

DEMOGRAPHIC DATA

A1 Type of hospital

Central hospital	
Regional hospital	
District hospital	

A2 Person in charge of OHS

Nurse Manager	
Occupational Health Nurse	
Risk Manager	
Professional nurse	
No person in charge	

POLICY EXISTENCE, COMPLIANCE AND IMPLEMENTATION

A3 Does the institution have an internal policy on occupational health and safety?
Yes No

A4 If the answer to A4 above is Yes
Is the policy visibly displayed for employees to see? Yes
No

A5 If the answer to A4 above is Yes
Is the policy communicated to employees? Yes
No

A6 Does the institution have the services of an OHS nurse? Yes
No

A7 Is there a health and safety committee in the institution? Yes
No

A8 Are there health and safety representatives in the institution? Yes
No

A9 Is there training provided for the OHS representatives Yes No

A10 Are nurses given safety training?
Yes No

A11 Are risk assessments conducted in the institution? Yes
No

If the answer is yes, how long ago was the assessment done?

.....
.....
.....
.....

A12 Are there any inspections done in the institution? Yes
No

If the answer is yes, how long ago was the inspection done?

.....
.....
.....
.....

A13 Any safety signs and /or posters displayed around the hospital? Yes
No

TRAINING AND INFORMATION DISSEMINATION

A14 Are health care workers trained on health and safety issues? Yes No

A15 Are there trained first aiders in the institution? Yes No

A16 Are members of the health and safety committee trained? Yes
No

A17 Is there any dissemination of information to employees pertaining to occupational injuries? Yes No

A18 Is there any dissemination of information to employees pertaining to occupationally contracted diseases? Yes
No

A19 Are the emergency drills conducted in the institution? Yes
No

A20 Is there an occupational health and safety training schedule for health care workers? Yes
No

MEDICAL SURVEILLANCE

A21 For which of the following conditions are employees periodically vaccinated?

Tuberculosis	
Hepatitis B	
Measles	
Influenza	
Rubella	

A22 Have all health care workers undergone pre-employment medical examination? Yes
No

A23 Is there a periodical screening of health care workers for hepatitis B? Yes
No

A24 Is there a periodical screening of health care workers for hepatitis C? Yes No

A25 Is there a periodical screening of health care workers for Tuberculosis? Yes
No

A26 Are pregnant employees reassigned to other duties temporarily? Yes
No

A27 Are there any warning signs or placards displayed in danger areas? Yes
No

HEALTH AND SAFETY INITIATIVES

A28 What are the factors that affect safety promotion in your institution, if any?

A29 What are the hospital interventions regarding health risks towards pregnant employees?

A30 What health and safety programmes would you like to see existing in the institution to promote occupational health and safety of health care workers?

ANNEXURE E

Part B: Checklist for review of records on occupational diseases and injuries

Part B: Checklist for review of records on occupational diseases and injuries

Evidence-based guidelines to promote the health and safety of health care workers in selected public hospitals in the Tshwane Healthcare District in Gauteng, South Africa.

The checklist is a data collection instrument used by the researcher to solicit data from occupational health and safety records or registers to assess occurrence of occupationally related injuries and diseases.

Data will help to describe and establish a trend in OHS injuries and diseases among health care workers in selected public hospitals in the Tshwane Healthcare District.

NB: The assistance of the Occupational Health Nurse (OHN) will be required when gathering the data. In the absence of the OHN, the risk manager or the nurse manager will be requested to participate

1. **OCCURENCE OF OCCUPATIONAL DISEASES**

Please mark appropriate box with and X

VARIABLE	ITEM	YES	NO	FIGUR	COMMEN										
Occupational y acquired Pulmonary / Extra Pulmonary Tuberculosi s (TB), MDR, XDR	B4. Number of nurses with occupational TB in the last 3yrs.														
	B5. Number of nurses with occupational MDR TB in the last 3yrs														
	B6. Number of nurses with occupational XDR TB in the last 3yrs														
	B7. Number of nurses on medical boarding due to ill health caused by TB and related complications in the last 3 yrs.														
	B8. Number of nurses who died due to occupational TB, MDR, XDR in the last														
Occupation ally acquired Hepatitis B	B9. How many nurses have contracted Hepatitis B in the workplace in the last 3yrs.?														
	B10. If any above, what was the commonest source of the infection? (Please mark the appropriate box) <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 80%;"><i>Needle stick injuries</i></td> <td style="width: 20%;"></td> </tr> <tr> <td><i>Accidental exposure to patients' infected blood</i></td> <td></td> </tr> <tr> <td><i>Accidental exposure to patients' infected body fluids other than blood.</i></td> <td></td> </tr> <tr> <td><i>Other</i></td> <td></td> </tr> <tr> <td>----- ---</td> <td></td> </tr> </table>	<i>Needle stick injuries</i>		<i>Accidental exposure to patients' infected blood</i>		<i>Accidental exposure to patients' infected body fluids other than blood.</i>		<i>Other</i>		----- ---					
		<i>Needle stick injuries</i>													
		<i>Accidental exposure to patients' infected blood</i>													
		<i>Accidental exposure to patients' infected body fluids other than blood.</i>													
		<i>Other</i>													
----- ---															
Occupation ally acquired Hepatitis C	B11. How many nurses have contracted Hepatitis C in the workplace in the last 3 years?														

	<p>B12. If any above, what was the commonest source of the infection? (Please mark the appropriate box)</p> <table border="1" data-bbox="644 360 1007 703"> <tr> <td data-bbox="644 360 1007 412">Needle stick injuries</td> <td data-bbox="1007 360 1075 412"></td> </tr> <tr> <td data-bbox="644 412 1007 486">Accidental exposure to patients' infected blood</td> <td data-bbox="1007 412 1075 486"></td> </tr> <tr> <td data-bbox="644 486 1007 595">Accidental exposure to patients' infected body fluids other than blood.</td> <td data-bbox="1007 486 1075 595"></td> </tr> <tr> <td data-bbox="644 595 1007 703">Other ----- -----</td> <td data-bbox="1007 595 1075 703"></td> </tr> </table>	Needle stick injuries		Accidental exposure to patients' infected blood		Accidental exposure to patients' infected body fluids other than blood.		Other ----- -----					
Needle stick injuries													
Accidental exposure to patients' infected blood													
Accidental exposure to patients' infected body fluids other than blood.													
Other ----- -----													
<p>Occupation ally acquired HIV</p>	<p>B13. Any reported incidences of accidental exposure to blood borne pathogens through needle prick injuries in the last 3yrs?</p>												
	<p>B14. Any reported incidences of accidental exposure to body fluids other than blood not resulting in HIV infection in the last 3yrs?</p>												
	<p>B15. How many nurses have seroconverted after exposure to body fluids in the workplace in the last 3yrs?</p>												
	<p>B16. If any above, what was the nature of the infection?</p>												
<p>Other occupation ally acquired diseases</p>	<p>B17. List of other common work-related diseases contracted by nurses in the last 3yrs</p> <p>----- ----- ----- ----- -----</p>												

2. OCCURRENCE OF OCCUPATIONAL INJURIES

VARIABLE	ITEM	YES	NO	FIGUR	COMMENT
Occupational MSDS	B18. How many nurses sustained MSDs during the course of their work in the last 3yrs?				
	B19. If any above, the cause was related to:				
	<i>Lifting of heavy patients</i>				
	<i>Bending related activities, e.g. bed</i>				
	<i>Type of unit</i>				
	<i>Long periods of standing</i>				
	<i>Other</i> ----- ----				
	B20. How many cases of nurses with occupational MSDs were reported to COIDA in the last 3yrs?				
B21. How many nurses were boarded off due to ill health related MSDs in the last 3yrs?					
B22. How many nurses were compensated for occupational MSDs in the last 3yrs?					

ANNEXURE F

PROOF-READING AND EDITING CERTIFICATE

ANNEXURE F

From: I. Manase
Department of English
University of the Free State
Bloemfontein

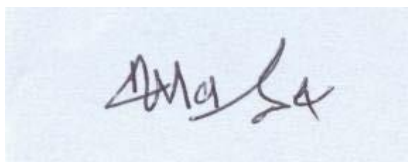
Date: 23 November 2016

To: Whom it may concern

Confirmation of proofreading and editing: Ms Odilia Monica Mamane Sehume's PhD thesis titled: *Evidence-Based Guidelines to Promote the Health and Safety of Health Care Workers in Selected Public Hospitals in Tshwane Health Care District in Gauteng, South Africa*

This serves to confirm that I have proofread and edited Ms Odilia Monica Mamane Sehume's above-noted PhD thesis. The suggested language and grammatical construction changes have been attended to and as such the thesis is now ready for submission for examination.

Sincerely

A handwritten signature in black ink on a light blue background. The signature appears to be 'I. Manase' written in a cursive style.

Irikidzayi Manase (Professor of English Studies)

Email: Irimanase@gmail.com

Cell: 082 298 6137