



The effectiveness of sensory stimulation therapy to strengthen the well-being of operating room nurses

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"It is only by standing on the shoulders of giants that

I have seen further" Sir Isaac Newton

PREFACE AND DECLARATION

An article format was chosen according to General Academic Rules A.7.2.5, A.7.2.5 and 7.8, as provided by the North-West University, for this particular study. Chantal Marais conducted the research and wrote the article. Dr. Emmerentia du Plessis acted as supervisor during the study and Prof. M.P. Koen as co-supervisor. The article will be submitted for publication in Health SA Gesondheid.

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(Health SA Gesondheid)

Consent for submission of the article was obtained from: Dr. Emmerentia du Plessis and Prof. M.P. Koen (co-authors).

I, Chantal Marais, Student Number 23161175, declare that all the work in the study is my own, without any plagiarism and that references in the text match the reference list.



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Permission is hereby given that the following article intended for publication in “Health SA Gesondheid” may be submitted by Chantal Marais for obtaining a M.Cur Degree in Health Service Management.

- The effectiveness of sensory stimulation therapy to strengthen the well-being of operating room nurses

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DECLARATION OF LANGUAGE EDITING

Completed by Gerda Fourie:

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ABSTRACT

Highly skilled nurses amongst the OR team, are needed in the operating room (OR) to ensure optimal patient safety. Shortages in experienced OR nurses and a stressful working environment prove to have a negative influence on effective safe patient care as well as a negative effect on nurses' own well-being.

The research focused on the effectiveness of sensory stimulation therapy (SST) to strengthen the well-being of nurses in the OR of a private hospital in the North-West Province. SST, better known as Snoezelen™, is a blend of sight, sounds, textures, aromas and motion providing stimulation to the primary senses (Collier, McPherson, *et al.*, 2010:698). The five primary senses are gently stimulated without any intellectual activity needed. A particular aim with SST is to improve the well-being of individuals by setting them at ease.

The well-being of OR nurses was studied from a resilience viewpoint assuming that, if exposure to stressors was limited and the individual did have an opportunity to recover, stressors may have a positive, toughening effect. Well-being and resilience was used interchangeably in the study. The objectives of the study were to explore and describe OR nurses' needs for SST, to explore and describe OR nurses' suggestions with regard to the implementation of SST in an OR and to explore and describe the effectiveness of a SST intervention to strengthen the well-being of OR nurses in a private hospital in the North-West Province.

An explorative, descriptive quasi-experimental design within a quantitative approach was used. Seventy two participants from two private hospitals in the North-West Province voluntarily participated in the research. A pre-/post-test design was used. One pilot group, one intervention group and one comparison group were identified. Participants from all three the participating groups completed a self administered resilience scale questionnaire before and after the implementation of a SST intervention. Before the intervention 100% participants from the pilot group, 100% participants from the intervention group and 96% participants from the comparison group completed the self administered resilience scale questionnaire. Participants of the intervention group also completed a self report questionnaire from which their needs could be determined and suggestions were made on the implementation of a SST intervention. A 98% response rate was obtained for these self report questionnaires. After the intervention the intervention group's participants were invited to write narratives regarding their experiences after visiting the SST room.

The intervention was implemented for a period of two consecutive months in the OR of one of the private hospitals. After the intervention an 88% response rate from the pilot group, 100% response rate from the intervention group and a 63% response rate from the comparison group, completing self administered resilience scale questionnaires, were obtained. Data was analysed with the assistance of a statistical consultant at the North-West University in Potchefstroom by using STATISTICA (version 10) and SPSS (version 20, release 20.0.0) (StatSoft Inc., 2011, SPSS Inc., 211). Results indicated that there was no statistical difference between the three participating groups regarding their resilience before the intervention. However, after the intervention, the intervention group demonstrated a statistical increase in their resilience levels.

Based on these results, as well as on conclusions of relevant literature and the feedback from participants in their written narratives, recommendations were formulated with regard to nursing education, nursing practice and further research. Briefly it means that there should be more consideration for OR nurses' well-being by means of a SST program providing for their needs. Recommendations included the benefits of a SST room in a hospital environment as well as complete instructions on how to create and to furnish such a room. Attributes of resilience, factors influencing resilience levels and methods to increase resilience levels in the workplace should be included in a regular in-service training program. For future research the researcher recommended further studies in order to determine the resilience levels in various departments of private hospitals. This could mean the successful implementation of a SST room in other departments as well which will eventually lead to the improved well-being of all nursing staff. The researcher is willing to act as a consultant if the need arises for the comparison groups to implement a SST intervention in their different departments.

Key words: Nurse, operating room, resilience, sensory stimulation therapy, well-being

OPSOMMING

Hoogs bekwame verpleegpersoneel word in die teater benodig ten einde optimale veiligheid van pasiënte te verseker. Daar is bewys dat 'n tekort aan ervare teaterverpleegpersoneel en 'n stresvolle werksomgewing die effektiwiteit van pasiëntesorg beïnvloed. Dit is ongeag van die negatiewe uitwerking wat dit op teaterverpleegpersoneel se persoonlike welstand het.

Die navorsingstudie was gefokus op die uitwerking wat sensoriese stimulasie terapie (SST) het om die welstand van teaterverpleegpersoneel in 'n privaat hospitaal in die Noord-Wes Provinsie te versterk. SST, beter bekend as Snoezelen™, is 'n samevoeging van klanke, teksture, aromas en beweging wat stimulasie voorsien aan die vyf primêre sintuie (Collier, McPherson, *et al.*, 2010:698). Die vyf primêre sintuie word sagkuns gestimuleer sonder dat enige intellektuele aktiwiteit nodig is. Die primêre doel van SST is om die welstand van die individu te verbeter deur hul gerus te stel.

Teaterverpleegpersoneel se welstand was vanuit 'n veerkragtigheidsoogpunt beskou wat veronderstel dat, indien blootstelling aan stressors beperk word en die individu 'n geleentheid kry om van spanning te herstel, dit positief en versterkend kan wees. Welstand en veerkragtigheid was gelykwaardig gedurende die studie. Die doelwitte van die studie was om teaterverpleegpersoneel se behoefte aan SST te bepaal en te omskryf, om teaterverpleegpersoneel se voorstelle met betrekking tot die implementering van SST in die teater te bepaal en te omskryf, en om die effektiwiteit van 'n SST intervensie te bepaal en te omskryf ten einde die welstand van teaterverpleegpersoneel in 'n privaat hospitaal in die Noord-Wes Provinsie te versterk.

Daar was van 'n ondersoekende, beskrywende kwasi-eksperimentele ontwerp binne 'n kwantitatiewe benadering gebruik gemaak. Twee-en-sewentig deelnemers van twee privaat hospitale in die Noord-Wes Provinsie het vrywillig aan die navorsing deelgeneem. Die ontwerp het 'n voorafgaande sowel as 'n opeenvolgende toets behels. Een loodsstudiegroep, een intervensiegroep en een vergelykende groep was geïdentifiseer. Deelnemers het voor en na die implementering van 'n SST intervensie 'n selfgeadministreerde vraelys ten opsigte van veerkragtigheid ingevul. Voor die intervensie, het 100% deelnemers van die loodsstudiegroep, 100% deelnemers van die intervensiegroep en 96% deelnemers van die vergelykende groep die selfgeadministreerde veerkragtigheidsvraelys voltooi. Deelnemers van die intervensiegroep het ook 'n persoonlike verslaggewende vraelys voltooi waarvolgens hul behoeftes bepaal kon word en aanbevelings vir die implimentering van 'n SST intervensie gemaak is. Voltooide

persoonlike verslaggewende vraelyste wat terug ontvang was vanaf die intervensie groep was 98%. Na die intervensie is deelnemers van die intervensie groep versoek om hul eie ondervindinge in die SST kamer te in 'n kort verhaal te skryf.

Die intervensie was vir 'n tydperk van twee opeenvolgende maande in die teater van een van die privaat hospitale geïmplementeer. Na die intervensie het 88% van die loodstudiegroep, 100% van die intervensiegroep en 63% van die vergelykende groep die veerkragtigheidsvraelyste voltooi. Data was met die hulp van 'n statistieke konsultant verbonde aan die Noord-Wes Universiteit in Potchefstroom deur middel van STATISTICA (weergawe 10) en SPSS (weergawe 20, vrystelling 20.0.0) geanaliseer (StatSoft Inc., 2011, SPSS Inc., 2011). Resultate het aangedui dat daar voor die intervensie geen statistieke verskille tussen die drie deelnemende groepe se veerkragtigheid was nie. Die intervensiegroep se veerkragtigheidsvlak het egter ná die intervensie merkwaardig verhoog.

Aanbevelings was op grond van die uitslae sowel as gevolgtrekkings van toepaslike literatuur en die geskrewe narratiewe van die intervensie groep vir verpleegopleiding, verpleging in die praktyk en verdere navorsing gemaak. Kortliks beteken dit dat daar meer begrip vir teaterverpleegpersoneel se welstand moet wees deur die implementering van 'n sensoriese stimulasie terapie program wat in hul behoeftes voorsien. Aanbevelings behels die voordele van 'n SST-kamer in 'n hospitaalomgewing, asook volledige aanwysings om die kamer in te rig. Kenmerke van veerkragtigheid, faktore wat veerkragtigheidsvlakke beïnvloed en metodes om veerkragtigheidsvlakke in die werksplek te verhoog, moet by 'n gereelde indiens opleidingsprogram ingesluit word. Die navorser het verdere studies vir toekomstige navorsing met betrekking tot die bepaling van veerkragtigheidsvlakke in onderskeie afdelings in privaat hospitale aanbeveel. Dit kan aanleiding tot die suksesvolle implementering van 'n SST-kamer in ander afdelings gee, wat uiteindelik alle verpleegpersoneel se welstand kan verbeter. Die navorser is beskikbaar om ook op te tree as konsultant indien die vergelykende groepe ook 'n behoefte aandui om 'n SST intervensie in hul betrokke afdelings te implimenter.

Kernkonsepte: Operasiesaal, sensoriese stimulasie terapie, veerkragtigheid, verpleegster, welstand

TABLE OF CONTENTS

ACKNOWLEDGEMENTS	i
PREFACE AND DECLARATION	iii
PERMISSION FOR PUBLICATION	iv
DECLARATION OF LANGUAGE EDITING.....	v
ABSTRACT	vi
OPSOMMING	viii
TABLE OF CONTENTS	x

SECTION 1

OVERVIEW OF THE STUDY	1
1.1 INTRODUCTION	1
1.2 RESEARCH PROBLEM	7
1.3 RESEARCH QUESTION	7
1.4 PURPOSE	8
1.4.1 Objectives.....	8
1.5 PARADIGMATIC PERSPECTIVE.....	8
1.5.1 Meta-theoretical assumptions	8
1.5.1.1 Person	9
1.5.1.2 Well-being and resilience	9
1.5.1.3 Environment	10
1.5.2 Theoretical assumptions	11

1.5.2.1	Hypotheses and theoretical assumption	11
1.5.2.2	Conceptual definitions	11
1.5.3	Methodological assumptions	13
1.6	RESEARCH DESIGN AND METHOD	13
1.6.1	Research design	13
1.6.2	Research method.....	16
1.6.2.1	Population and sample	16
1.6.2.1.1	Population	16
1.6.2.1.2	Target population	17
1.6.2.1.3	Accessible population	17
1.6.2.2	Sample	17
1.6.2.2.1	Sampling method	17
1.6.2.2.2	Sample size	17
1.6.2.3	Data collection	18
1.6.2.3.1	Pilot study	21
1.6.2.4	Data analysis	22
1.7	RIGOUR	22
1.8	ETHICAL ASPECTS	23
1.9	LITERATURE REVIEW.....	24
1.9.1	Introduction	24
1.9.1.1	Job dissatisfaction	24
1.9.1.2	Well-being of operating room nurses from a resilience viewpoint	26

1.9.1.3	Sensory stimulation therapy	27
1.9.2	Conclusion.....	29
1.10	SUMMARY	30
1.11	OVERLAY OF THE STUDY	30

SECTION 2

ARTICLE	31
THE EFFECTIVENESS OF SENSORY STIMULATION THERAPY TO STRENGTHEN THE WELL-BEING OF OPERATING ROOM NURSES	32
HEALTH SA GESONDHEID AUTHOR RECOMMENDATIONS.....	33
Requirements to which the authors of articles must conform	33
Review	34
The effectiveness of sensory stimulation therapy to strengthen the well-being of operating room nurses	40
AUTHORSHIP	42
ASSUMPTION – COPYRIGHT RESERVED.....	43
ETHICAL CLEARANCE	44
FUNDING	47
DECLARATION OF LANGUAGE EDITING	48
ABSTRACT	49
OPSOMMING	51
BACKGROUND.....	53
PURPOSE AND OBJECTIVES	58
RESEARCH DESIGN	59

RESEARCH METHOD.....	59
Research population and sampling	59
Measuring instruments.....	59
Research procedure	60
Statistical analysis	62
Results	63
Needs and suggestions	63
Descriptive statistics, internal consistency and reliability	63
Statistical significance.....	64
Discussion	65
Conclusion	67
REFERENCE LIST	72
Diagram A: Intervention group participant's individual needs for SST intervention	80
Pictures: Sensory stimulation room in the OR	81
Diagram B: Themes identified from narratives	82
Table 1: Descriptive statistics - age, health, depression and resilience	83
Table 2: Cronbach's alpha reliability coefficient - before intervention	84
Table 3: Various resilience levels according to Wagnild and Young's	85
Table 4: Results of ANOVA on pre-test of resilience - Cohens d coefficient	86
Table 5: Spearman Rank Order correlation	87
Table 6: Dependent t-test in each group on increase in resilience	88
Graph 1: Resilience levels before and after intervention of different participating groups	89

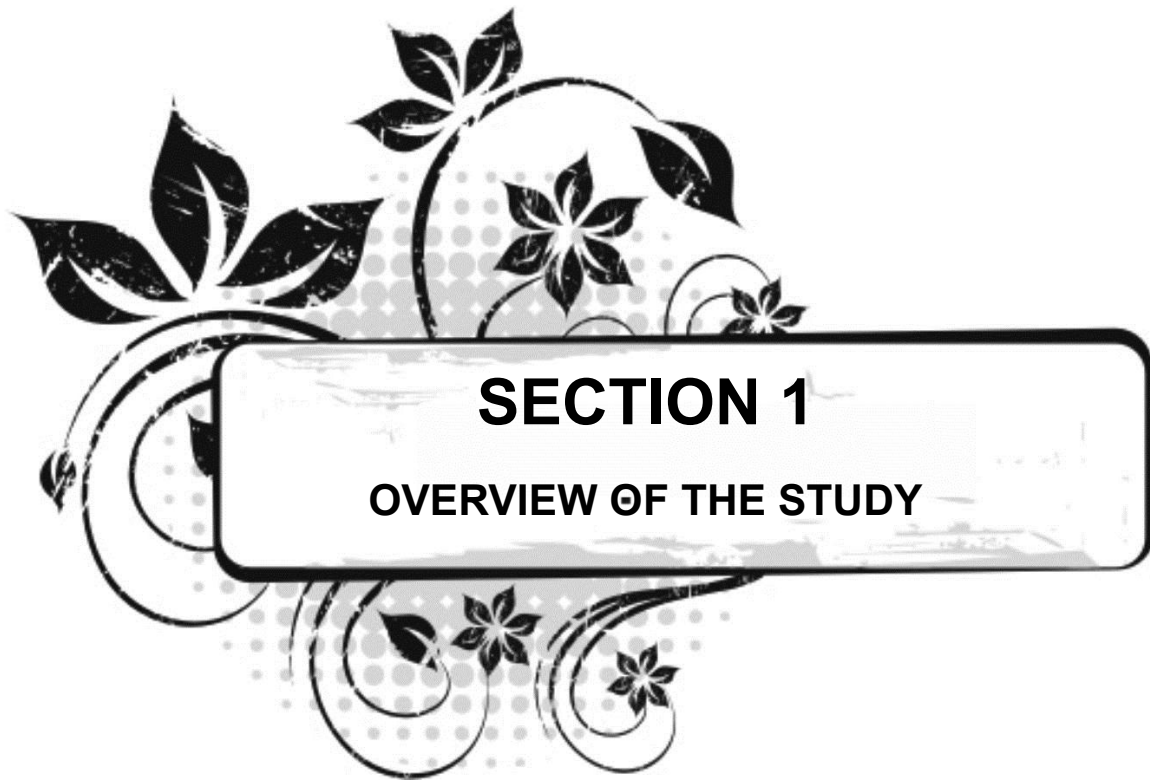
Table 7: ANCOVA post-test controlling for pre-test differences	90
Self-report questionnaire – designed by the researcher.....	91

SECTION 3

CONCLUSIONS, LIMITATIONS AND RECOMMENDATIONS	93
1. INTRODUCTION	93
2. CONCLUSIONS	93
2.1 Literature conclusions	93
2.2 Empirical conclusions	94
2.2.1 Conclusions from results and discussion	95
3. LIMITATIONS OF THE STUDY	96
4. RECOMMENDATIONS	97
4.1 Recommendations for nursing practice	97
4.2 Recommendations for nursing education	99
4.3 Recommendations for future research	100
5. CONCLUSION BY THE RESEARCHER	100
6. REFLECTION BY THE RESEARCHER	101
REFERENCE LIST	102

APPENDIX A	119
APPENDIX B	122
APPENDIX C	124
APPENDIX D	126

Ethics Application: NWU-00036-11-S1 (M.P. Koen & E. du Plessis)	127
Confirmation of ethical clearance	128
APPENDIX E	130
APPENDIX F	133
APPENDIX G	136
APPENDIX H	139
Pictures : SST room in the OR	140



OVERVIEW OF THE STUDY

The overview commences with an introduction comprising of the motivation for leading to this study followed by the research problem, researcher's assumptions, the research question, the purpose of the study and the study objectives. The researcher's paradigmatic perspective is also stated. The research design and method with an explanation of the population, the sample, data collection, pilot study and data analysis are also discussed. Rigour and the ethical aspects are reflected. This section concludes with a literature overview on job dissatisfaction, the well-being of operating room nurses and sensory stimulation therapy. Section two consists of an article about the research according to the recommendations and criteria of the journal "Health SA Gesondheid". The last section includes the conclusion, recommendations and limitations of the study.

1.1 INTRODUCTION

Nurses in general report stress predominantly related to illnesses and burnout (Firth-Cozens, 2001:215-222; Tummers, Landeweerd, *et al.*, 2002:183-206) due to increased work-load, high health risks in terms of infectious diseases, confrontations with death and suffering, poor communication and social support, shift work and emotional demands (Firth-Cozens, 2001:215-222; Pisanti, Gagliardi, *et al.*, 2003:523-536). In a report from the Commonwealth of Australia the same high working demands in nursing were identified, including frequent schedule changes and the lack of appreciation by superiors and colleagues (Productivity Commission, 2005:58-59).

Research regarding high working demands was presented at the International Council of Nurses' (ICN) 24th Quadrennial Congress in which 2 000 nurses participated in a global survey on challenges and opportunities. Participating countries included Brazil, Canada, Colombia, Japan, Kenya, South Africa, Taiwan, Uganda, the United Kingdom and the United States. As much as 46% of the nurses confirmed that the work-load is currently worse compared to the previous five years, which has an impact on the quality of patient care. The most concerning factors for participants in the study were heavy work-load (42%), insufficient benefits and salaries (22%), lack of recognition (15%) and too much bureaucracy (13%) (ICHRN, 2009:3-4). Sufficient staff, involvement in decision-making

and a balanced work-life can significantly contribute towards the well-being of nurses and a fulfilled nursing career (ICHRN, 2009:3-4).

Recent studies on the public health sector in South Africa have shown that the main determinants for increased job dissatisfaction and impaired well-being are high work-load, limited resources, negative working conditions, emotional climates in departments, an unsatisfactory work environment and a shortage of nurses (Bester & Engelbrecht, 2009:104-117; Hall, 2004:28-36; Kekana, Du Rand, *et al.*, 2007:24-35; Nyathi & Jooste, 2008:28-37; Uys, Minnaar, *et al.*, 2004:50-56). In a similar survey completed by Van der Westhuizen (2008:1-69), 60% of nurses in the private sector indicated that they want to leave the profession. Reasons for leaving included insufficient salaries, excessive work-load, limited career advancement, ineffective management, safety concerns and patient overloads (Van der Westhuizen, 2008:8-22). Dissatisfied employees may cause or passively allow conditions to worsen. This can lead to insufficient patient care, decrease in efforts, increased error and shortages in nursing staff (Robbins, 1996:196-197). Thus, it is evident that all these factors contribute to high levels of stress in nursing.

Contributing factors to stress also include the amount of inexperienced nurses (Gillespie, Chaboyer, *et al.*, 2007:427-438), stress of working with too many patients (Hegney, Eley, *et al.*, 2006:1521-1530), spending insufficient time with patients in need (Boykin, Schoenhofer, *et al.*, 2003:223), making life changing decisions in limited time (Egan, 1993:109-125), continuous contact with other members of the multi-professional team who are also severely stressed, and conflict situations with colleagues (Skovholt, 2011:130-133). Staff shortages is rated the most stressful regarding nursing demands with excessive administrative duties next in line (Van der Colff & Rothmann, 2009:1-10). The well-being of nurses experiencing high levels of stress is at risk, especially in highly specialised departments.

The operating room (OR) can be defined as a specialised department in the hospital. Specialised nursing areas are complex departments, especially due to the unique stressors associated with those specific areas. Physician abuse, poor communication, overlapped responsibilities, ethical problems, perceived aggressive behaviour between OR personnel, emotional labour and teamwork problems are unique stressors in the OR leading to job dissatisfaction, a decrease in the well-being of nurses and insufficient patient care (Coe & Gould, 2008:609-618; Higgins & MacIntosh, 2010:321-327; Katz, 2007:152-158; Timmons & Tanner, 2005:85-91). As a result of high patient demands and high stressful work-load, competent skilled trained registered nurses in specialised

departments need to be retained. At the end of 2011, only 2 459 of 22 788 registered nurses in SA were trained in operating room nursing (SANC, 2011:1).

As the OR relies on highly skilled nurses for optimal patient safety it can indeed be identified as one of the most stressful departments in healthcare (Gillespie & Kermode, 2003:24-33). From the researcher's own experience as a professional trained theatre nurse, shortages in experienced nurses and a stressful work environment do have an influence on effective safe patient care. Due to inadequate skilled theatre nurses, highly skilled and qualified nurses have to take some of the unskilled theatre nurses work-load of which the result is that patient safety demands cannot be fully complied to. High stress levels, burnout, sleep deprivation and bad working relationships are some of the negative effects OR nurses experience as a result of these extra responsibilities (Coe & Gould, 2008:609-618; Higgins & MacIntosh, 2010:321-327; Katz, 2007:152-158; Timmons & Tanner, 2005:85-91). Thus, OR nurses are exposed to a higher risk of stress and a low morale which can influence their own well-being negatively.

The current situation of OR nurses emphasises the need for a positive working environment. According to Rondeau and Francescutti (2005:327-340), a positive working environment can be defined as settings that support excellence, quality patient care, health, safety and the personal well-being of staff. It also enhances employees and organisation's motivation, productivity and performance. Identified characteristics of a positive environment include the following: health and safety policies for employees, fair work-load and job demands, good support to peers, employees taking part in decisions, shared values, work schedules permitting a good balance between work and personal life, equal opportunities, safe staffing levels and management support to employees (ICN, International Hospital Federation, *et al.*, 2008). A work environment benefits from these characteristics, which include: higher employee retention rates, improved teamwork, continuous safe patient care, improved patient outcomes, strong interpersonal relationships, a decrease in absenteeism and turnover rates, employees feel respected and valued for their work, and it enhances effective teamwork (Lowe, 2002:49-56; Wheelen, Burchill, *et al.*, 2003:527-534; Work Foundation, 2007). These identified factors affect the work environment and are essential to improve interventions. On the other hand, negative conditions can have the opposite effect.

Decreasing nurse numbers, increasing work-load and incompetencies contribute to a stressful and negative working environment. Consequently, it influences patients and nurses negatively (RNAO, 2006:1-139). Long working hours with extreme job demands definitely affect employee's personal relationships, their sick profile, conflict management

and job satisfaction, leading to high turnover rates (ICN, International Hospital Federation, *et al.*, 2008). Furthermore, case management, documentation and other administrative duties challenge health professional's time available for hands on patient care (Physiotherapy Association of British Columbia, 2007).

Thus, there is a need for a deeper insight and understanding of the well-being of nurses remaining in the operating room despite of difficult work conditions. The well-being of OR nurses may be studied from a resilience viewpoint. The term well-being and resilience will thus be used interchangeably. Resilience is a dynamic process in which the individual positively adapts to adversity or risk (Friedli, 2009:1-64; Herrman, Saxena, *et al.*, 2005; Masten & Reed, 2005:74-88). After a stressful event the resilient individual has the capacity to rebound and maintain a healthy outcome (Rutter, 2007:205-209; Silver, 2009:343). Absence of resilience can cause ongoing psychological distress (Bonanno, 2004:20-28). In contrast, if exposure to stressors is limited and the individual has an opportunity to recover, stressors can have a positive, toughening effect (Dienstbier, 1989:84-100). Aspects of resilience are hope, optimism, coping, self efficacy, sense of coherence, mental health and well-being (Koen, Van Eeden, *et al.*, 2011a:2). In studies completed by Koen *et al.* (2011a:1-11; 2011b:103-120), it is indicated that professional nurses with higher levels of resilience reflect these characteristics and that they can cope with daily stressors. This positive feature of well-being derives from positive psychology.

The positive psychology movement has identified resilience as a multi-faceted factor which enables an individual to bounce back and thrive during difficult circumstances (Keyes, 2007:95-108; Seligman & Csikszentmihalyi, 2000:5-14). Martin Seligman identified the need for a psychological study about individual creativity, resilience, optimism and lastly, happiness. This was when the positive psychology movement was established. Positive psychology is a scientific study about strength, well-being, resilience and optimal functioning (Duckworth, Steen, *et al.*, 2005:631; Wong, 2011:72) with the aim to understand the factors allowing individuals, communities and societies to thrive (Fredrickson, 2001:218-226; Seligman & Csikszentmihalyi, 2000:5-14). Positive psychology focuses on positive emotions such as happiness, gratitude and fulfillment; positive individual traits such as optimism, resilience and character strengths; positive relationships among groups and enables institutions to foster positive outcomes (Gable & Haidt, 2005:103-110; Linley & Joseph, 2004:3-14; Peterson, 2006; Peterson & Seligman, 2003:14-27; Seligman, 2002; Seligman & Csikszentmihalyi, 2000:5-14; Seligman, Steen, *et al.*, 2005:410-421). The same is said about nursing. According to Vander Zyl (2002:4) the work of nurses has to be meaningful to them before they can take responsibility for the improvement of patient's well-being. If nurses cannot cope with all the stressors in their

workplace, it is likely that their entire lives will be effected negatively (Cilliers, 2002:61-85) which can lead to insufficient patient care. Therefore, strategies need to be implemented to counteract these negative effects (Valent, 1995:21-50), and to strengthen positive emotions.

These emotions include positive subjective experiences from the past, present and future, including satisfaction, well-being, happiness and constructive thoughts of optimism and hope (Seligman, 2003:xvi). Positive emotions play an important role in positive psychology as far as the promotion of resilience is concerned (Fredrickson, 2001:218-226). According to the Broaden and Build theory, positive emotions broaden people's curiosity, creativity, exploration and play, and foster physical, intellectual and social resources for optimal functioning. Negative emotions are adapted in a short period of time, whilst long term effects result from frequent positive emotions, and build personal resources for continued growth (Fredrickson, 1998:300-319; Fredrickson, 2001:218-226; Fredrickson, 2005:120-134). The latter has a positive influence on resilience.

People with high levels of resilience experience more positive emotions and recover quicker from stressors (Fredrickson, 1998:300-319; Fredrickson, 2001:218-226; Fredrickson, 2005:120-134). Positive emotions such as creativity, bravery, kindness, tenacity and optimism increase resilience (Seligman, 2002). Eminence of resilience can take place within persons (coping and optimism), among persons (social support) and across social levels (educational systems) (Masten & Reed, 2005:74-88). The following approaches in positive psychology can improve resilience:

- Change in "explanatory style": Day-to-day events and interaction between colleagues can be interpreted differently (Buchanan & Seligman, 1995; Friedli, 2009:1-64; Seligman, 1998).
- Learning skills enhancing optimistic thoughts and positive reactions to improve resilience (Seligman, 1998; Friedli, 2009:1-64).
- Skills based on learned optimism, include: To challenge beliefs, to avoid thinking traps, to be calm and focused and to put things into perspective (Kobau, Seligman, *et al.*, 2011:3). These skills promote mental health and equip the individual with techniques to avoid excessive worries and to prevent spirals of negative thoughts (Seligman, 1998).
- Appreciative Inquiry: This is a process managers of organisations can follow by focusing on positive assumptions about people, their organisation, their

employees and relationships (Cooperrider, Whitney, *et al.*, 2003). The focus once placed on problem solving is now on the strengths of a group, thus providing a positive change (Cooperrider, Whitney, *et al.*, 2003; Ludema, Whitney, *et al.*, 2003).

According to Seligman and Csikszentmihalyi (2000:7) "a science of positive, subjective experience, positive individual traits, and positive institutions promises to improve the quality of life and prevents the pathologies that arise when life is barren and meaningless". Further studies focusing on resilience must stress the importance of interventions to promote competence (Friedli, 2009; Yates & Masten, 2004:521-539).

Part of a multi-faceted, comprehensive strategy to strengthen resilience may be sensory stimulation therapy (SST) which contributes to a positive work environment (Koen & Du Plessis, 2011). SST, better known as Snoezelen™, is a blend of sight, sounds, textures, aromas and motion providing stimulation to the primary senses (Collier, McPherson, *et al.*, 2010:698). The five primary senses are gently stimulated without any intellectual activity needed. A particular aim with SST is to improve the well-being of individuals by setting them at ease. SST can be implemented to help improve the following needs: Stress management and relaxation, psychiatry, management of chronic pain, mother and child care and dementia care. SST can be created according to individual needs, in any suitable area and by any member of the multi-professional team (Bailon, Van Diepen, *et al.*, 2002:444-452; Bera, 2008:1-3; Collier, McPherson, *et al.*, 2010:698-703; Van Weert, Janssen, *et al.*, 2006:656-668). The use of this therapy may make a huge contribution to the well-being of OR personnel working in a cold and clinical atmosphere. Individual needs of OR nurses should be explored after which a suitable area in the OR complex can be identified to create a multi-sensorial environment. Currently SST research broadly focuses on neurology (Dang-Vu, McKinney, *et al.*, 2010:R626-R627; Korosi & Baram, 2009:1-8), and the intellectually disabled person (Asher, Shapiro, *et al.*, 2010:E25-26; Fava & Strauss, 2010:160-171). However, there is currently a lack in research about SST in an OR as part of an approach to strengthen resilience.

From this discussion it becomes clear that the health and well-being of OR nurses might be at risk, leading to possible low standards of quality patient care. A comprehensive, multi-faceted approach and process is necessary to strengthen their resilience, in this case that of OR nurses in a private hospital in the North-West Province. Such an approach is in collaboration with an already existing research project, namely the RISE

project. The purpose of RISE is to develop a comprehensive, multi-faceted approach to strengthen the resilience of health care givers as well as risk groups including professional nurses (Koen & Du Plessis, 2011).

1.2 RESEARCH PROBLEM

The RISE project suggests that it might be valuable to explore and describe SST as an intervention to strengthen nurses' well-being (Koen & Du Plessis, 2011). However, current research on SST mainly focuses on intellectually disabled persons (Asher, Shapiro, *et al.*, 2010:E25-26; Fava & Strauss, 2010:160-171), whilst sensory stimulation therapy for OR nurses in a private hospital in the North-West Province seems to be unexplored.

This problem is further accentuated by the fact that quality patient care depends predominantly on a vibrant healthy workforce. It is evident from previous studies that nurses predominantly report stress related illness and experience several factors leading to job dissatisfaction and a high turnover rate in qualified experienced nurses (Firth-Cozens, 2001:215-222; Pisanti, Gagliardi, *et al.*, 2003:523-536; Tummers, Landeweerd, *et al.*, 2002:183-206,). Furthermore, it is evident that the work environment may have a positive effect on the well-being of nurses (Gerber, Nel, *et al.*, 1998:229; RNAO, 2006:1-139).

OR nurses in a private hospital in the North-West Province seem to experience a very low morale and decreased productivity due to shortages of experienced OR nurses and a high work-load. Thus, the well-being of remaining OR nurses is a big concern and nurses need an opportunity to develop resilient attributes in order to improve their own well-being. It is currently not clear if SST might be effective to strengthen the well-being of nurses, leading to the research question.

1.3 RESEARCH QUESTION

The above discussion leads to the following research question:

Can the well-being of OR nurses be strengthened by means of SST?

1.4 PURPOSE

The purpose of the study was to determine the effectiveness of SST as an intervention to strengthen the well-being of OR nurses in a private hospital in the North-West Province.

1.4.1 Objectives

The following objectives were formulated:

1. To explore and describe OR nurses' needs for SST in a private hospital in the North-West Province.
2. To explore and describe OR nurses' suggestions with regard to the implementation of SST in an OR environment in a private hospital in the North-West Province.
3. To explore and describe the effectiveness of an SST intervention to strengthen the resilience of OR nurses in a private hospital in the North-West Province.

1.5 PARADIGMATIC PERSPECTIVE

A paradigm is the researcher's view of the world's complexities (Polit & Beck, 2012:11), and guides research decisions. The paradigmatic perspective was described as meta-theoretical, theoretical and methodological assumptions.

1.5.1 Meta-theoretical assumptions

A holistic approach guided the researcher's meta-theoretical assumptions by focussing on the biophysical, psychological, social and cognitive aspects of an individual. This is supported by the view that "the interaction of the multiple subsystems and the inherent bases create holism" (Erickson, Tomlin, *et al.*, 1983:45). This view is also supported by the notion that the global nature and totality of the individual is much greater than the sum of its component parts (Christensen, Johnson, *et al.*, 2011:371).

Thus, discussed within this holistic approach were the following assumptions: Person, well-being and resilience, and environment.

1.5.1.1 Person

The researcher sees a “person” as a fascinating holistic human being created in God's own image, and who has a collection of emotional, mental and physical aspects that need to be assessed individually and looked after. It is also the researcher's belief that a person has the ability to understand and respect other people despite of perceived differences due to daily interaction in the same external environment.

In this research, “person” refers to someone who works in the operating room and includes registered scrub nurses, registered nurses, registered enrolled nurses and registered auxiliary nurses.

1.5.1.2 Well-being and resilience

The researcher views “well-being” as complex and multi-faceted: a combination of emotional, physical and social aspects. The well-being of a person is the ability to be productive in his/her external environment which in turn makes it possible to cope with daily stressors and to ensure quality of life by maintaining a positive emotional, physical and social well-being. The emotional state and physical and social performance of operating room nurses may be affected by a low morale and poor resilience. Furthermore, the researcher views “resilience” as the ability to bounce back from difficult internal and external circumstances, if the person maintains a positive emotional, physical and social well-being. Internal and external risk factors in an organisation can have an influence on a person's well-being and resilience.

In line with the World Health Organization's (WHO, 2011:1) view on mental health as well as in line with views on resilience (Rutter, 2007:205-209; Silver, 2009:343) well-being is seen as a dynamic process in which nurses realise their potential, can cope with normal life stress, can work productively and fruitfully, and is able to make a contribution to their community. The individual reflecting a good well-being has the capacity to rebound and maintain a healthy outcome after stressful events.

In this research, well-being focuses on the resilience of operating room nurses, namely their ability to cope despite difficult conditions. Well-being and resilience are thus used interchangeably.

The promotion of resilience in OR nurses can be based on Kumpfer's resilience framework (Kumpfer, 1999:179-244) (see Figure 1). Kumpfer identifies factors influencing the development of resilience. Acute stressors or challenges, external environmental

context, internal self-characteristics and outcomes are referred to as the domain of influence. The conjunction of two transactional points, namely the environment and the individual on the one hand, and the individual and the choice of outcomes on the other, is between two domains. Looking at Kumpfer's framework from a nursing viewpoint, daily exposure to stressors or challenges in the OR can have a negative influence on the environmental context. These negative risk factors lead to negative relationships with colleagues and a decrease in quality patient care, influencing social support amongst colleagues. Internal self-characteristics such as optimism, hope, self-efficacy, sense of coherence, mental health and well-being have an influence on the outcome of resilience. All these influences can affect the resilience levels of OR nurses positively or negatively.

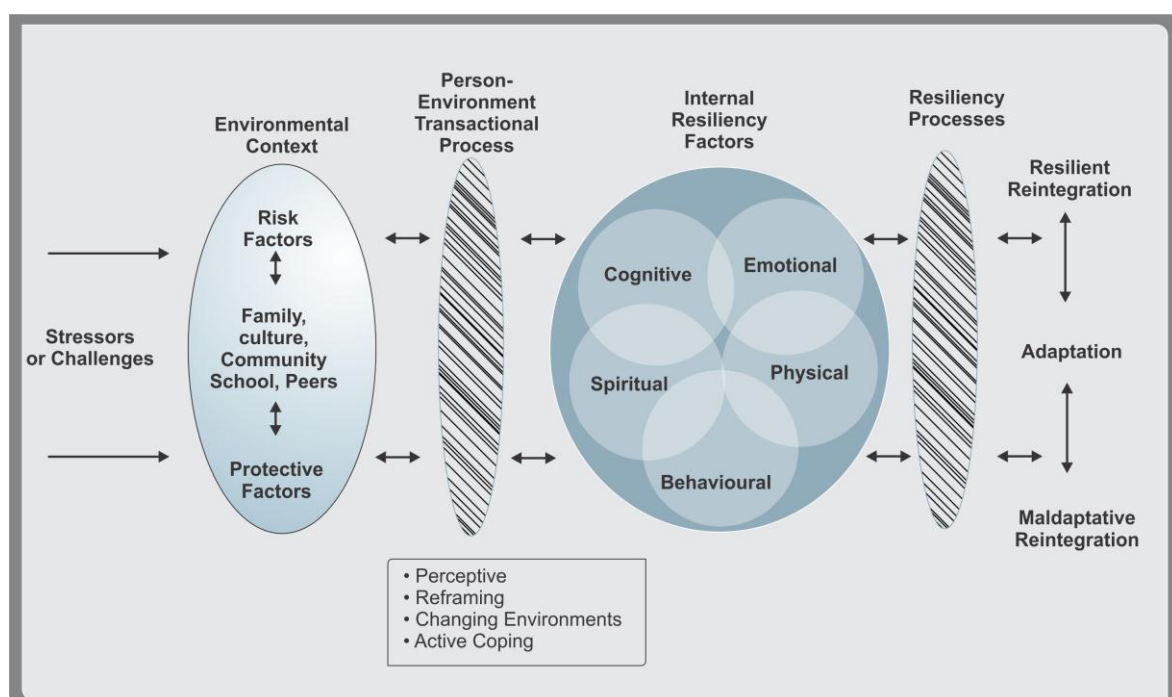


Figure 1: Resilience framework, according to Kumpfer (1999) - reproduced with kind permission of Springer Science and Business Media

1.5.1.3 Environment

The researcher views the “environment” as an external area where persons – OR nurses – with a common goal – patient safety – interact. Negative events in the environment have an effect on a person’s emotional, physical and social well-being.

According to Erickson (2002:452) “the theorists see environment in the social subsystems as the interaction between self and others both cultural and individual”.

In this research, the external environment refers to the operating room.

1.5.2 Theoretical assumptions

1.5.2.1 Hypotheses and central theoretical assumption

In line with the fact that the effectiveness of SST as intervention will be determined, the following hypotheses were formulated:

H₀: Participating in SST will not strengthen the well-being of OR nurses in a private hospital in the North-West Province.

H₁: Participating in SST will strengthen the well-being of OR nurses in a private hospital in the North-West Province.

In addition, a central theoretical assumption was formulated to guide the research:

Understanding the effectiveness of SST as intervention to strengthen the well-being of OR nurses in a private hospital in the North-West Province as well as insight in OR nurses' needs and suggestions with regard to SST will lead to the formulation of recommendations for the implementation of this therapy as intervention to strengthen OR nurses' well-being.

1.5.2.2 Conceptual definitions

▫ Resilience

According to Tusaie and Dyer (2004:3-11), resilience can be defined as “a dynamic process that results in adaptation in the context of significant adversity”. In the OR, resilience may help to alleviate the results of stress. Resilience is an adaptive quality contributing to the preservation of independent functioning and well-being, decreasing the risk of becoming depressed (Aroian & Norris, 2002:54-67; Row & Kahn, 1997:433-440). The individual reflects behaviour that facilitates adaption to significant adversities in the workplace. Competence, collaboration and control have an adverse effect on nurse's resilience. Nurses in the OR need to be given the opportunity to develop resilient attributes so that they can be retained in their speciality area.

▣ Operating Room

The operating room is part of the restricted surgical suite where the actual surgery takes place (Phillips, 2007:177). It also includes the recovery room, stores and an area where staff prepare for surgery as well as a pre- and post-operational care section.

▣ Nurse

For the purpose of this study “nurse” includes the peri-anesthesia nurse, the circulating nurse, the scrub nurse and the nurse as part of the non-sterile team. These nurses may be professional trained theatre nurses, professional nurses, enrolled staff nurses or auxiliary nurses.

▣ Peri-anesthesia Nurse

The peri-anesthesia nurse is part of the non-sterile OR team who renders patient care in the preoperative and postoperative area (Phillips, 2007:57). These nurses may be professional nurses and enrolled staff nurses.

▣ Circulating Nurse

The tasks of this nurse, as part of the non-sterile OR team, include patient assessment, planning and critical thinking skills (Phillips, 2007:57). These nurses may be professional nurses, enrolled staff nurses and auxiliary nurses.

▣ Scrub Nurse

A scrub nurse, as part of the sterile OR team, assists with surgery by passing on sterile instruments to the surgeon. The scrub nurse must be a professional nurse or a professional trained theatre nurse (Phillips, 2007:57).

▣ Non-sterile Team Nurse

These nurses are not wearing sterile attire and are working in non-sterile areas of the OR, e.g. the central sterilisation department (Phillips, 2007:57). Nurses in this field may be professional nurses, enrolled staff nurses and auxiliary nurses.

▣ Sensory Stimulation Therapy (SST)

Sensory stimulation therapy, better known as Snoezelen™, is a blend of sight, sounds, textures, aromas and motion that stimulate the primary senses (Collier, McPherson, *et al.*,

2010:698). The purpose of SST is to stimulate individual's five primary senses in a relaxed atmosphere to improve their well-being and to set them at ease.

In this research SST entailed an intervention designed by the researcher according to literature on SST and guided by the supervisors who are experienced in this field. The purpose of this intervention was to create a relaxed atmosphere for nurses in the OR to improve their resilience levels by stimulating their five primary senses whilst in the work environment.

1.5.3 Methodological assumptions

The researcher believes in ethical research to improve the current situation in the OR. Therefore, a systematic process and appropriate methods have been used to obtain information contributing and generating new knowledge with regard to the specific topic (Babbie & Mouton, 2001:7; Brink, 2006:3, 12; Burns & Grove, 2009:719; Strydom, 2005:57). Furthermore, assumptions of the researcher, the research problem and context and objectives for the research were the platform for this study and guided research decisions. The objectives of this study were to explore and to describe the need, suggestions and effectiveness of SST to strengthen the well-being of OR nurses, and the researcher expected that this should have enabled the formulation of recommendations for the implementation of this therapy as intervention to strengthen OR nurse's well-being.

Moreover, the researcher took in the position of an observer, who was not personally involved, in order to measure and analyse reality without as little bias as possible. As far as the epistemological assumption was concerned, the researcher was independent from participants, which implies uninfluenced findings of the study and that each participant regulated her own behaviour and participation in the study (Creswell, 2003; Pender, 1996; Polit & Beck, 2012:13).

1.6 RESEARCH DESIGN AND METHOD

1.6.1 Research design

Since no research has previously been conducted regarding the implementation of SST in an OR as part of an approach to strengthen well-being an explorative descriptive quasi-experimental design with a quantitative approach was used.

The aim of a quasi-experimental design is to determine causality between an intervention and an outcome. Quasi-experiments are also known as controlled trials with non-randomisation and a pre-/post-intervention study design (Eliopoulos, Harris, *et al.*, 2004:1586-1591; Polit & Beck, 2012:217).

According to Shadish *et al.* (2002) and Polit and Beck (2012) advantages of quasi-experiments include:

- Much easier set up than experimental designs, because quasi-experiments can be used when randomisation is impractical.
- Matching is used instead of randomisation
- Minimizes threats to external validity for natural environments are not exposed to problems as compared to artificial or laboratory controlled settings.
- Includes natural experiments.
- Findings can be applied in other settings, followed by generalisation regarding specific populations.
- Quasi-experiments are also effective in longitudinal research.
- Very practical and ensure some research control when full rigor is not possible.

The researcher decided on the specific design for the following reasons:

- A small sample size was available for the study. Thus, non-randomisation was applied.
- A natural environment was used for the study so that the findings can be generalised to similar departments in the hospital environment.
- Although the sample size was small, the findings can be generalised to specific related departments in the hospital.
- The intervention was implemented over a time period of two consecutive months, fitting into the characteristics and advantages of a quasi-experimental design.
- A pre- and post-test supplied the researcher with accurate results after the implementation of the intervention.

In addition, an explorative descriptive design was appropriate to investigate nurse's needs and suggestions regarding SST as well as the effectiveness of the therapy to strengthen OR nurses' well-being (Polit & Beck, 2012:18).

According to Uys and Basson (1991:38) an explorative descriptive design has the following characteristics:

- It is a flexible design, providing that the researcher can examine all aspects of the studied phenomena.
- It aims to develop new knowledge.
- Results may lead to recommendations for future studies.
- The study is usually in a natural setting.

The researcher applied this specific research design with abovementioned features to obtain optimal results for future recommendations.

A quantitative approach was used in this study. Characteristics of a quantitative study include:

- Careful measurement by which a single reality can be defined.
- Quantitative research is usually brief.
- It describes and examines relationships.
- It determines causality among variables.
- Data are statistically analysed.
- It identifies similarities and differences between different data.
- Reliable and valid instruments are used.
- Different instruments can be used to collect comprehensive data.
- It explains specific characteristics of specific individuals, situations or groups.

This study attempted to quantify, or calculate the effectiveness of SST as an intervention to strengthen the well-being of OR nurses in a private hospital in the North-West Province. Quantitative data can be analysed systematically and converted into formal and objective numbers. Obtained data can then be used to describe variables and their specific relationships.

1.6.2 Research method

The research method is discussed according to the population and sampling, data collection and data analysis.

Nurses from two private hospitals in the North-West Province participated in the study. A pilot group, an intervention group and a comparison group participated. The intervention group consisted of participants from the largest OR department of one of the private hospitals. The pilot group consisted of participants from the other OR department and the comparison group consisted of participants from the ICU department from the one private hospital.

Participants in all three groups completed a pre- as well as a post-test before and after the implementation of the intervention. Baseline data allowed the researcher to assess the resilience levels of all the participants in all three participating groups before the intervention. If any positive post-test differences were observed within the intervention group the researcher could be assured that the intervention definitely had a positive effect (Polit & Beck, 2012:217).

As observer the researcher shared information on SST with the participants and incorporated their needs and suggestions in the development of an SST intervention. The researcher thus used information sessions, a resilience questionnaire, a self report questionnaire and narratives after the intervention to collect data. All three participating group's participants attended the information sessions and completed the resilience questionnaire before and after the implementation of the intervention.

The self administered questionnaire was only given to the intervention group to identify their specific needs so that the SST room could be prepared accordingly. After the intervention the researcher also requested narratives from some of the participants in the intervention group to describe their experiences when they were visiting the SST room.

1.6.2.1 Population and sample

1.6.2.1.1 Population

The population was the focus of the study and included professional trained theatre nurses, professional nurses, enrolled staff nurses and auxiliary nurses working in the OR and ICU of two private hospitals in the North-West Province. The largest OR department of the two hospitals was included in the intervention group and the other OR department

in the pilot group. ICU nurses were included in the comparison group. Forty one (n=41) nurses in the OR department, eight (n=8) nurses in the other OR department and twenty three (n=23) nurses in the ICU department were seen as the population of the study.

ICU nurses were included in the study, for the ICU department can be defined as another specialised department in the hospital. Nurses in the ICU experience the same high stressful work-load due to complexities and unique stressors in the department. Results prove that the ICU currently experiences a high turnover rate in experienced trained ICU nurses, leaving the department with high levels of stress and nurses with less resilience. Thus, they demonstrated similar characteristics as OR nurses and could therefore be used as the comparison group.

1.6.2.1.2 Target Population

The target population included individuals who met the sample criteria of the study, including:

- Nurses working in OR departments – including OR rooms, central sterilization departments, recovery rooms - and the ICU.
- Nurses who could read and write English.
- Volunteer participants.

1.6.2.1.3 Accessible population

The accessible population included employed individuals in OR departments and ICU of two private hospitals in the North-West Province.

1.6.2.2 Sample

1.6.2.2.1 Sampling Method

The researcher intended to gather information in an unexplored area. Therefore, an all inclusive sample was used.

1.6.2.2.2 Sample size

Statistical conclusions are reached if the researcher makes use of an adequate number of participants (Polit & Beck, 2012:283). A larger sample ensures a larger represented population and a smaller chance for sample error Christensen, Johnson, *et al.*, 2011:160; Polit & Beck, 2012:284). Various factors have an influence on the sample size, including

effect size, population homogeneity as well as cooperation and the attitude of participants (Polit & Beck, 2012:285). A small, but adequate sample was appropriate for this study, because the researcher noticed a strong relation between the independent (SST intervention) and dependent (well-being of OR nurses) variables (Polit & Beck, 2012:285). The participating groups had a limited variability, making the groups homogenous (Christensen, Johnson, *et al.*, 2011:160; Polit & Beck, 2012:50). By taking into account the cooperation and attitude of participants the researcher had to provide for those declining from the study, as data were collected over a period of time (Christensen, Johnson, *et al.*, 2011:162; Polit & Beck, 2012:285). In the light of these requirements, the researcher was obliged to consult a statistical consultant about the size of the sample, although an all-inclusive sample was used. A sample size of forty one (n=41) for the intervention group, twenty three (n=23) for the comparison group and eight (n=8) for the pilot group were seen as adequate. Only eight (n=8) participants of the intervention group handed in narratives after the implementation of the SST room.

1.6.2.3 Data collection

Using a pilot, intervention and a comparison group, pre- and post-intervention data were collected from all three groups to evaluate the impact of the intervention and to rule out internal validity threats (Polit & Beck, 2012:217, Christensen, Johnson, *et al.*, 2011:241). Data collected during the pilot study could be included in the pre-test data. The intervention was implemented over a period of two consecutive months and consisted of the implementation of SST in an identified area in the OR of a private hospital in the North-West Province. Data collection as applied in this research is visually illustrated in Diagram 1, followed by a discussion.

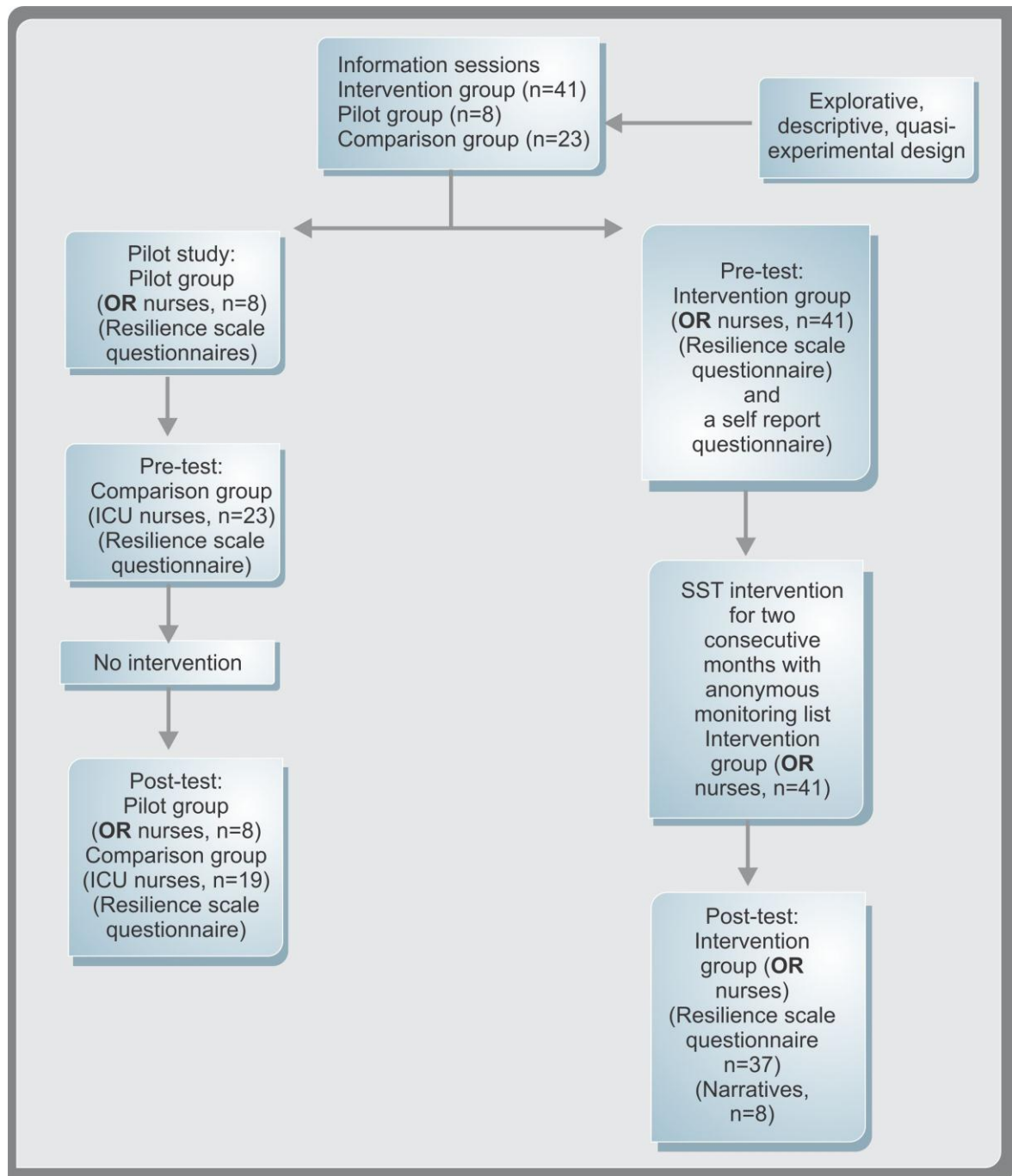


DIAGRAM 1: DATA COLLECTED FROM PILOT, INTERVENTION AND COMPARISON GROUP'S PARTICIPANTS

Before collecting the data the researcher held information sessions to inform participants about the planned study, including the research problem, the purpose and objectives of the study, the data collection methods, sensory stimulation therapy and ethical considerations. The researcher then collected the data which entailed the following:

Pre-test

All three participating group's participants completed a self administered resilience scale questionnaire developed by Wagnild and Young (1993) (Appendix A) in the pre-test to determine current resilience levels of OR and ICU nurses in two private hospitals in the North-West Province. The resilience scale questionnaire has been validated in previous studies (Girtler, Gasari, *et al.*, 2010:669-678; Nishi, Uehara, *et al.*, 2010:310; Wagnild, 2009:105-113; Wagnild & Young, 1993:165-178), and permission to use the questionnaire was obtained (see Appendix A).

Many resilience scales have been developed and used, but the Wagnild and Young resilience scale proved to be the best scale to study resilience (Ahern, Kiehl, *et al.*, 2006:103-125). The purpose of the Wagnild and Young resilience scale is to identify an individual's degree of resilience (Windle, Bennett, *et al.*, 2011:12). Resilience is embraced with five imperative characteristics on which Wagnild and Young developed the resilience scale, namely purpose, perseverance, self reliance, equanimity and existential aloneness (Wagnild, 2010:1). The scale represents a high degree of internal consistency (Abiola & Udofia, 2011:4).

A structured self report questionnaire (Appendix B) was also completed by the interventional group from which participant's needs and suggestions regarding SST were taken in order to implement the intervention.

With the research objectives in mind the following questions were included in the structured self report questionnaire:

1. In your opinion, what do you think sensory stimulation therapy (SST) involves?
2. Have you ever participated in SST?
3. If you answered yes, what did you gain from participating in the SST?
4. Do you think there is a need to implement SST in the OR?
5. If you answered yes, where would you suggest will be a suitable area in the OR for implementation?
6. What will you like to be included into a SST area?

These questionnaires were appropriate to examine participant's resilience levels and to identify their needs, suggestions and perceptions (Burns & Grove, 2009:406; Christensen, Johnson, *et al.*, 2011:56). All volunteer participants received printed questionnaires by hand, as it was expected that personal contact will have a very good influence on the response rate (Christensen, Johnson, *et al.*, 2011:57; Polit & Beck, 2012:311). When questionnaires are distributed personally, participants have the opportunity to ask questions and personal distribution is very inexpensive (Christensen, Johnson, *et al.*, 2011:57; Polit & Beck, 2012:311). The researcher could obtain immediate responses to be analysed immediately.

SST intervention (Intervention group)

An SST intervention – called the SST room, was designed and implemented according to relevant literature and as preferred by the intervention group. The utilisation of the SST room was monitored during the intervention by means of an anonymous attendance list (Appendix C) that was available in the same room. This was done in order to establish evidence that the SST intervention was utilised by the intervention group as well as to indicate the extent of the particular utilisation.

Post-test

A post-test followed the implementation of the intervention. It implied that participants from the pilot group, intervention group and comparison group had to complete the resilience scale questionnaire again to identify any changes in their resilience levels. In order to enrich data (Polit & Beck, 2012:504), participants in the intervention group were invited to write short narratives about their experiences of the SST intervention.

1.6.2.3.1 Pilot study

According to Christensen *et al.* (2011:277-278) a pilot study is defined as an experiment conducted on a percentage of participants before the actual data for the study is collected. A pilot study is a good guideline to the researcher indicating any unclear instructions or questions in the given questionnaire. Most importantly, it indicates whether the questionnaire is feasible, reliable, valid and useable (Burns & Grove, 2009:44, 333; Christensen, Johnson, *et al.*, 2011:277-278; Polit & Beck, 2012:643). Should there be any negative factors that may influence the study, it will be reflected in the pilot study which enables the researcher to correct the malfunction before the experiment starts (Christensen, Johnson, *et al.*, 2011:278; Polit & Beck, 2012:644).

The researcher conducted a pilot study on participants in the smaller OR to ensure that instructions regarding the given resilience questionnaire were clear and refined and to determine unanticipated effects (Polit & Beck, 2012:333). Participants indicated that they found the questionnaire clear and did not suggest any changes. Data gathered from the pilot study could thus be included together with data from the comparison group.

1.6.2.4 Data analysis

According to Brink (2006:170) raw data need to be categorised, ordered, manipulated and summarised to answer the research question. Statistical analysis is the best method to communicate quantitative data to the reader (Brink, 2006:171). To describe and summarise the data, descriptive inferential statistics were appropriate methods to analyse the gathered data and included measures such as frequency distribution, central tendency, variability and measures of relationships (Brink, 2006:171; Kremelberg, 2011:118). Descriptive statistics describe the data that have been gathered and inferential statistics test hypotheses (Kremelberg, 2011:58). ANOVA theory was used with inferential statistics. ANOVA stands for analysis of variance (Kremelberg, 2011:136). The structured self report and narratives were analysed by means of thematic coding (Howitt & Cramer, 2010:Part 4:18, 21), also known as referential coding (Bernerd & Ryan, 2010:76). This entails that codes are used to mark instances of themes in collected data which the researcher can use as reference to themes located in the text (Bernerd & Ryan, 2010:76).

1.7 RIGOUR

According to Shadish *et al.* (2002:34) the approximate truth of an inference is defined as validity. Rigour is affected by four types of validity, namely statistical validity, internal validity, construct validity and external validity (Polit & Beck, 2012:236-237). Statistical validity, as well as construct validity was ensured by using an already existing and validated resilience scale questionnaire (Polit & Beck, 2012:241).

Furthermore, the researcher ensured intervention validity by means of information sessions with participants of the intervention, faithful implementation of the intervention according to literature and the preferences of participants, monitoring the delivery of the intervention to participants and following steps to promote participation during the intervention, (Polit & Beck, 2012:255) such as daily maintenance of the SST room, which included cleaning the room, filling up the aroma therapy equipment, continuously changing the flavours, providing different kind of beverages to stimulate taste senses and changing the features of the room with different equipment on a daily basis.

Internal validity is threatened by temporal ambiguity, selection, history, maturation, mortality, testing and instrumentation (Polit & Beck, 2012:255). Therefore, the researcher ensured internal validity by competent decisions with regard to the appropriate design and method for the study (Polit & Beck, 2012:255). External validity refers to the generalisation of findings (Burns & Grove, 2009:225). Due to the specific population and sample, it was the intention that findings in this study will only be generalised to the identified population and similar departments in the hospital. The written narratives by participants in the intervention group made it possible for the researcher to communicate the positive contribution of the SST room to other members who participated in the study and to similar departments.

1.8 ETHICAL ASPECTS

Ethical approval was obtained from the Ethics Committee of the North-West University – NWU-00036-11-S1, under the RISE study (Appendix D). Written consent was also obtained from both private hospitals where the study was conducted (Appendix E).

Prospective participants were informed in detail about the proposed study (Polit & Beck, 2012:154) and they had the right to self determination. The participants' right to self determination was protected in the sense that they could withdraw at any given time, and that they did not have to give any information that they were uncomfortable with (Brink, 2006:31; Polit & Beck, 2012:154). No rewards were offered to participants in order to enable them to participate voluntarily in the study. The researcher clearly stated the purpose of the study to participants in order to ensure that deception did not take place (Polit & Beck, 2012:154).

Written informed consent was obtained from participants who decided to participate in the study (Polit & Beck, 2012:157). Informed consent included a written presentation containing all necessary information regarding the study that was handed to participants to read before they signed consent (Appendix F). The following information was included in the presentation: Objectives of the study, the type of data to be collected, description of the data collection procedures, timeframe allocated to the study, an explanation of the participation selection process that was followed, potential risks and benefits, confidentiality and anonymity pledge, voluntary consent, participants' right to withdraw and withhold any information and contact information of the researcher if participants wanted any further information (Polit & Beck, 2012:158).

The researcher ensured anonymity by using a coding system when participants completed the structured self report questionnaire and the resilience scale questionnaire (Brink, 2006:34-35; Polit & Beck, 2012:162). Each participant was identified by a specific code or number only known to the researcher. The original identification list was safely locked away to increase confidentiality (Brink, 2009:35). No given information will be reported publicly to reveal the identities of participants.

1.9 LITERATURE REVIEW

1.9.1 Introduction

The operating room (OR) is a specialised department with extreme stress-related working conditions. Nurses are not always equipped to excel under these difficult circumstances which lead to job dissatisfaction, a poor well-being and decreased patient care. A way to cope with these problems is to be resilient – a key factor that has not been explored in this specific set-up.

Sensory stimulation therapy (SST) might be considered in the OR to ensure, and even to strengthen resilience. Therefore, the aim of this literature review is to gain more information on resilience and SST to design a SST intervention to strengthen the resilience of OR nurses. In this regard specific themes were studied, namely job dissatisfaction, well-being of operating room nurses from a resilient viewpoint and sensory stimulation therapy.

The following are related databases used for this specific research: Science Direct, Sabinet, PubMed, EbscoHost, using the following key words: Job dissatisfaction, well-being, resilience, operating room nurses and sensory stimulation therapy.

1.9.1.1 Job dissatisfaction

Job dissatisfaction in the nursing profession raises several issues globally, of which increasing numbers of resigning nurses is one. This serious matter in turn leads to global staff shortages. Consequently, quality patient care and patient needs are directly influenced, for example by high turnover rates of nurses (Gray & Phillips, 1996:273-289; Shields & Ward, 2001:677-701; Tai, Bame, *et al.*, 1998:1905-1924). Studies completed in the United States of America, Canada, England, Scotland and Germany show that emotional exhaustion and problems in work design are some of the reasons for leaving the profession (Aiken, Clarke, *et al.*, 2001:43-53). According to a completed analysis by

Yin and Yang (2002:573-581) factors leading to high turnover rates include stress caused by staff shortages, undesirable management styles, relationships with supervisors, career opportunities and rigid policies in the workplace. Nurses in Western countries are mostly concerned about their abilities to ensure quality patient care due to a shortage of nurses, inappropriate skill mix and altered organisational design (Fagin, 2001:1-24).

Consequently the profession has dissatisfied nurses in both the public and private health sectors. Reasons for job dissatisfaction in the public sector vary from unsatisfactory working conditions to a lack of equipment, nurse shortages and not enough support from employers and managers (Hall, 2004:28-36). In previous studies the main determinants for job dissatisfaction include work-load, poor working conditions, uncompetitive remuneration and limited resources (Bester & Engelbrecht, 2009:104-117; Chang & Hsu, 2000:63-74; Chung, Chen, *et al.*, 2004:15-21; Kekana, Du Rand, *et al.*, 2007:24-35). A study in KwaZulu-Natal showed that 319 nurses from different government health care positions are also dissatisfied with their jobs. The study also proved that the average job satisfaction is 60% and personal satisfaction 72%. 50% of participants indicated that they are the least satisfied with “pay and prospects” (Uys, Minnaar, *et al.*, 2004:50-56). In a survey by Van der Westhuizen (2008:1-69), 60% of nurses working in the private sector indicate that they want to leave the profession. Insufficient salaries, excessive work-load, limited career advancement, ineffective management, safety concerns and patient overloads are some of the reasons why nurses leave (Van der Westhuizen, 2008:8-22). Van der Colff and Rothmann (2009:1-10) find that staff shortages is rated the most stressful regarding nursing demands with excessive administrative duties next in line. Increasing work-load, educational changes and the increased ageing of nurses have lately contributed largely to higher stress levels with an impact on specialised nursing departments, such as the operating room (ACORN, 2003; Arndt, 1998:32-34; Buerhaus, Staiger, *et al.*, 2000:111-116; McVicar, 2003:633-642, Mulcahy & Betts, 2005:519-523; Productivity Commission, 2005:16-18). A common problem discussed in all mentioned literature is nurse shortages due to resignation. This causes a setback for healthcare in general, but for purposes of this study the focus is on OR nursing staff.

The OR as a complex specialised department has unique stressors. Physician abuse, poor communication, overlapped responsibilities, ethical problems, perceived aggressive behaviour between OR personnel, emotional labour and teamwork problems lead to job dissatisfaction, decrease in the well-being of nurses and insufficient patient care (Coe & Gould, 2008:609-618; Higgins & MacIntosh, 2010:321-327; Katz, 2007:152-158; Timmons & Tanner, 2005:85-91). These facts lead to the need for a deeper insight into the well-being of nurses in the OR from a resilience viewpoint.

1.9.1.2 Well-being of operating room nurses from a resilience viewpoint

It is expected of OR nurses to work with precision at a quick pace to ensure optimal patient safety. Thus, the well-being of OR nurses is of the utmost importance in every respect. According to literature positive mental health or well-being can be classified into two dimension namely hedonic and eudemonic health. Hedonic health includes positive feelings or positive affects like subjective well-being, life satisfaction and happiness. On the other hand, eudemonic health refers to positive functioning, like engagement, fulfillment, sense of meaning and social well-being (Carlisle 2006:51; Huppert, 2005:307-340; Lyubomirsky, King, *et al.*, 2005:803-855; Ryan & Deci, 2001:141-166; Samman, 2007:51). Completed studies prove that healthier workers are more productive (Pellieter, 2005:1051-1058; Pellieter, Boles, *et al.*, 2004:746-754; Serxner, Gold, *et al.*, 2001:25-29), less absent from work due to sickness and perform better (Cropanzano & Wright, 1999:252-265; Harter, Schmidt, *et al.*, 2003:268-279; Lyubomirsky, King, *et al.*, 2005:803-855; Pelled & Xin, 1999:875-895; Wright & Staw, 1999:31-34). Companies receive a positive return on investments in the health of their employees (Burton, Chen, *et al.*, 2006:131-143; Carroll & Wachs, 2004:481-489; Eisner, Yelin, *et al.*, 2002:1506-1513; Lahiri, Gold, *et al.*, 2005:530-541; Lerner, Adler, *et al.*, 2004:S46-S55; Rost, Smith, *et al.*, 2004:1202-1210; Stewart, Ricci, *et al.*, 2003:2443-2454). Preventing injuries and illnesses in the workplace and preserving optimal health ensure less absenteeism and time is not lost due to a lack of staff (Office of Technology Assessment, 1995). It thus seems important to explore the well-being of OR nurses.

Looking at the well-being from a resilience viewpoint entails that positive attributes such as competence, self-esteem, continual growth and elasticity in relation to change, superior coping, advanced self-help, communication and problem solving skills are considered (Garmezy, 1981:196-269; Garmezy, 1991:459-460, 463-466; Garmezy, Maten, *et al.*, 1984:97-111; Hauser, Vieyra, *et al.*, 1985:81-100; Murhy & Moriarty, 1976; Rutter, 1979:324). Gradual exposure to stress and the opportunity to recover from this stress has a positive effect on individuals (Dienstbier, 1989:84-100). This recovery is the ability to adjust positively after adversity (Peterson & Bredow, 2004:342) by bouncing back and thriving through difficult circumstances (Keyes, 2007:95-108; Seligman & Csikszentmihalyi, 2000:5-14). The absence of resilience can cause ongoing psychological distress (Bonanno, 2004:20-28). Professional nurses with higher levels of resilience reflect characteristics of hope, optimism, coping, self efficacy, sense of coherence, mental health and an overall good well-being (Koen, Van Eeden, *et al.*, 2011:2). Resilience could be strengthened by sensory stimulation therapy as an intervention to create a positive working environment (Koen & Du Plessis, 2011:1-11).

1.9.1.3 Sensory stimulation therapy

Sensory stimulation therapy is a combination of different visuals, textures, aromas and motions aiming to provide trust and relaxation, to improve the well-being of individuals in a calm atmosphere where no intellectual activities are needed and to stimulate the five primary senses (Burns, Cox, *et al.*, 2000:118-126; Collier, McPherson, *et al.*, 2010:698; Hutchinson & Kewin, 1994:196-212). Human beings live in a world filled with light, sound, smells, tastes and tactile sensations sensed by the eyes, ears, nose, mouth and skin (Fowler, 2007:15; Hulsegge & Verheul, 1987). According to Brown (2001:125), “life involves a constant encounter with the sensory world”. When the five senses are stimulated actively, it is likely that an individual becomes more aware of his surroundings (Verkaik, van Weert, *et al.*, 2005:301-314).

Sensory stimulation therapy, also known as Snoezelen™ therapy, was developed by two Dutch therapists, Jan Hulsegge and Ad Verheul. They combined two Dutch words, “snuffelen” and “doezelen” to form the word Snoezelen. The meaning of “snuffelen” is to browse and “doezelen” to doze or relax (Fava & Strauss, 2010:160-171; Hutchinson, 1991; McKenzie, 1995:11; Thompson & Martin, 1994:341-344; Hulsegge & Verheul, 1987). “Snuffelen” highlights aspects of sensory stimulation whilst the word “doezelen” involves relaxing or restful activities (Hutchinson & Haggard, 1991:18-48). During the 1970’s Hulsegge and Verheul worked at an institute for intellectually disabled people in the Netherlands where they successfully created a sensory stimulation tent. The tent was decorated with all kinds of sensory stimulators, like bottles containing scent, projected water images on a screen, musical instruments, tactile objects, soaps and tasteful food. Positive verbal as well as non-verbal feedback was obtained from especially low-functioning patients. The aim of the intervention was to give individuals with disabilities an opportunity for leisure and relaxation (Burns, Cox, *et al.*, 2000:118-126; McKenzie, 1995:11).

The philosophy of Snoezelen™ involves the presentation of daily non-directive and non-threatening relaxed activities (Fava & Strauss, 2010:160-171) in an atmosphere filled with trust and an appeal to the primary senses, giving the individual a range of choices as well as time and space for exploration (Fowler, 2007:27-28). The aim of Snoezelen™ is to encourage individuals to rather enjoy exploring their surroundings than to gain knowledge or information from the experience (Fowler, 2007:28; Hulsegge & Verheul, 1987). According to Kewin (in Fowler, 2007:28), “the essence of snoezelen is to allow the individual the time, space and opportunity to enjoy the environment at their own pace, free

from the expectations of others". Thus, Snoezelen™ mainly involves relaxation (Hulsegge & Verheul, 1987).

Identified areas in healthcare for Snoezelen™ include: Stress management and relaxation, psychiatry, management of chronic pain, mother and child care and dementia care (Bailon, Van Diepen, *et al.*, 2002:444-452; Bera, 2008:1-3; Collier, McPherson, *et al.*, 2010:698-703; Van Weert, Janssen, *et al.*, 2006:656-668). In a study completed by Champagne and Sayer (2003:1-13), 47 patients from the psychiatry unit in a community hospital participated in a study to assess whether the use of a sensory room could reduce perceived levels of distress. Diagnoses of participants included some form or a combination of schizophrenia, schizoaffective disorder, bipolar disorder, major depression, adjustment disorder, anxiety disorder, panic disorder, substance abuse and borderline personality disorder. The sensory room was equipped with vestibular, tactile, olfactory, gustatory and auditory equipment to stimulate their primary senses and to facilitate relaxation. Participants' individual needs were stimulated when visiting the sensory room. Treatment in the sensory room involved exploration and the use of equipment, self-soothing exercises, relaxation exercises and therapy balls. Ninety-eight percent of the participants' self-perceived levels of stress changed positively. Only ten percent reported no change and one percent reported a negative change. Participants who indicated the highest level of distress before using the sensory room also indicated the highest amount of change in perceived stress levels (Champagne & Sayer, 2003:3-13).

Completed studies with regard to the application of Snoezelen™ include individuals with developmental disabilities, autism, children with brain injuries and individuals with chronic pain (Ashby, Broxholme, *et al.*, 1995:303-307; Cuvo, May, *et al.*, 2001:183-204; Kaplan, Clopton, *et al.*, 2006:443-455; Schofield, 2000:33-34; Shapiro, Parush, *et al.*, 1997:140-155). All mentioned studies describe the use of a Snoezelen™ room positively, although the positive effects only last for a limited time after leaving the room.

Completed studies also show that Snoezelen™ has a very positive effect on dementia care. Participants show less disturbed behaviour levels (Holtkamp, Kragt, *et al.*, 1997:124-128), higher levels of enjoyment; individuals have better relationships with others, talk spontaneously, recall memories and are very attentive to their environment (Baker, Bell, *et al.*, 1998). According to Moffat *et al.* (1993) sadness and fear are reduced on the one hand, and happiness and interest increased immensely on the other. It has furthermore been reported that Snoezelen™ rooms improve self-confidence and self control, creativity and relationships with others. It also decreases aggressive and challenging behaviour (King, 1993:93-112; Kwok, To, *et al.*, 2003:122-126).

In SST it is important to determine an individual's specific needs. SST, according to individual needs, motivates participation in the program and also ensures a favourable sensory experience (Lotan, 2006:792). Any suitable area can be used for such a program and the therapy can be maintained by any member of the multi-professional team (Bailon, Van Diepen, *et al.*, 2002:444-452; Bera, 2008:1-3; Collier, McPherson, *et al.*, 2010:698-703; Van Weert, Janssen, *et al.*, 2006:656-668).

During the development of SST the following should be kept in mind: Individuals observe visual details with their visual senses, for example colors, shapes and movements (Flaghouse, 2008b). The auditory sense provides details with regard to sounds including volume, rhythm, tone and sequence (Flaghouse, 2008b). The tactile sense keeps an individual in touch with his/her surroundings and is another important way of communication by feeling temperature, vibration and pain. Taste comes from the mouth where sweet or sour, bitter or sweet, spicy and salt is sensed. The olfactory senses enable an individual to experience the environment through smell and bring back pleasurable memories (Flaghouse, 2008b). Different methods can be applied to stimulate these senses separately or simultaneously.

Bubble tubes, fiber optic equipment, light projectors and various mats, and vibrating cushions can all stimulate the visual and tactile senses (Flaghouse, 2008b; Sweetwater County School District Two, 2008-2012:1). An individual not only recognises, but also becomes more sensitive to colors by looking at the moving water bubbles in the tubes whilst relaxing at the same time. A person's tactile senses are stimulated when the bubble tubes vibrate in his hands (Flaghouse, 2008b). Light is an important visual stimulator which can be projected on a wall, the ceiling, in a mirror or on the floor to change the mood in a sensory stimulation room and to ensure color sensation (Flaghouse, 2008b). Auditory and olfactory senses can be stimulated with soft, relaxing music and aromatherapy units (Flaghouse, 2008b; Sweetwater County School District Two, 2008-2012:1). These methods can be combined to offer controlled multi-sensory stimulation which has become a recognised method of intervention to reduce stress and to create more adaptive behaviour in individuals (King, 1993:93-112; Lavie, Shapiro, *et al.*, 2005:84).

1.9.2 Conclusion

It becomes clear from the abovementioned literature that the implementation of a sensory stimulation therapy room in the OR could possibly give nurses the opportunity to relax and recover from stressful events, thereby strengthening their resilience. Such a room in OR

should comply with the different individual needs of OR nurses, ensuring a relaxed and calm atmosphere. Visiting the sensory stimulation room should not require cognitive inputs of individuals, but equipment in the room should stimulate OR nurses' five primary senses in order to promote relaxation and recovery from stressful events.

Equipment can include bubble tubes, fiber optics, light projectors, vibrating cushions and various mats. Light is very important to stimulate individuals' visual senses. Lights can be projected on walls and the ceiling in the entire room. Soft, calm and relaxing music combined with different aromatherapy flavours stimulate auditory and olfactory senses. A combination of different equipment ensures controlled multi-sensory stimulation giving OR nurse's the opportunity to recover from stressful events. Nurse's resilience was strengthened after visiting the sensory stimulation room in the OR.

1.10 SUMMARY

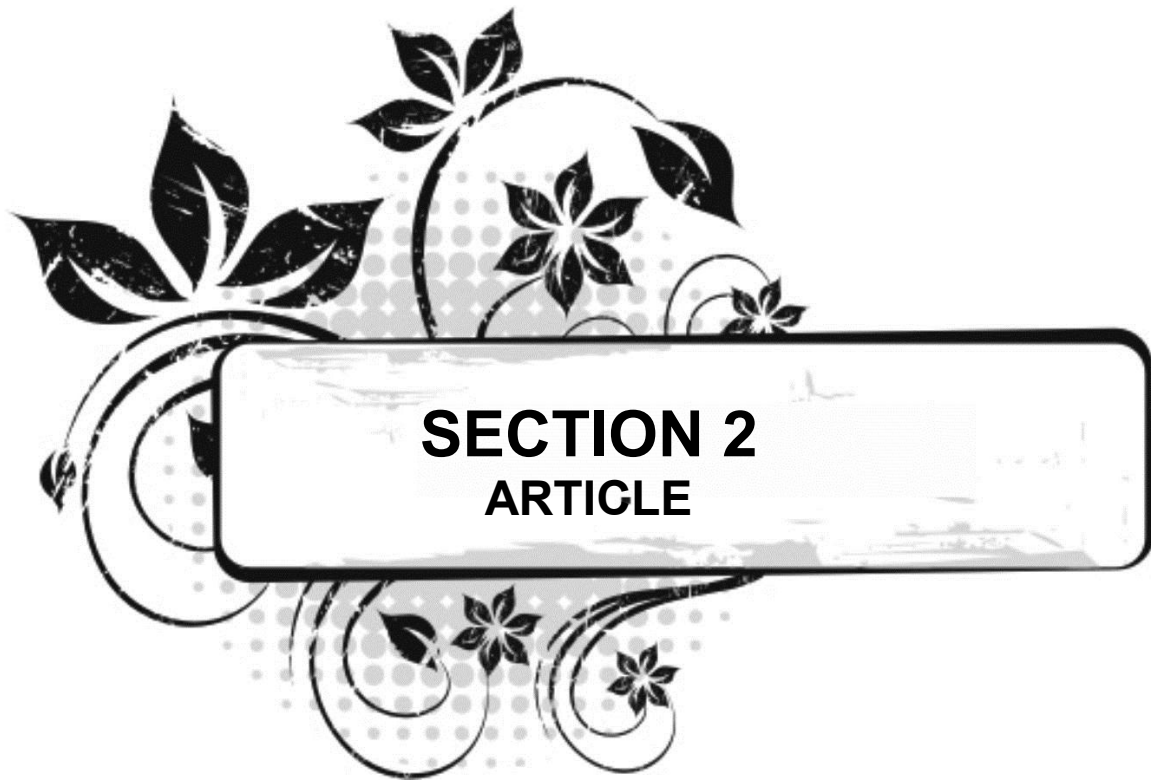
The background, research problem, objectives, research design and research method, as well as a literature review were discussed in this section.

1.11 OVERLAY OF THE STUDY

The study was written in article format according to the General Academic Rules, as provided by the North-West University. The study included the following elements:

- Section 1: Overview of the study
- Section 2: Research findings were written in an article format with the title: "The effectiveness of sensory stimulation therapy to strengthen the well-being of operating room nurses."
- Section 3: Conclusions, limitations and recommendations to implement a SST intervention to strengthen the well-being of OR nurses were made.

The next section contains an article on the effectiveness of sensory stimulation therapy to strengthen the resilience of OR nurses.



THE EFFECTIVENESS OF SENSORY STIMULATION THERAPY TO STRENGTHEN THE WELL-BEING OF OPERATING ROOM NURSES

To be submitted to “Health SA Gesondheid”



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DE VOS, AS; STRYDOM, H; FOUCHE, CB; POGGENPOEL, M & SCHURINK, W 1998: Research at grass roots. A primer for the caring professions. Pretoria: Van Schaik Academic.

DURRHEIM, K 1997: Social constructionism, discourse and psychology. **South African Journal of Psychology**, 27(3):175-182.

FOUCAULT, M 1984: Nietzsche, genealogy, history. (In: Rainbow, P ed. 1984: The Foucault reader. Harmondsworth: Penguin, pp 76-100).

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The ethical measures adhered to during this research process are those set out by DENOSA (Democratic Nurses Association of South Africa, 1998:3-7).

Stein, Brailowsky and Will (1995:105), however, note that points of divergence are seen even within rodents of the same species. Yet sex differences do occur both in response to injury and in recovery of function, female rats in normal oestrus showing less oedema following frontal cortical contusions than males, and more severe oedema than females who are not in oestrus (Stein *et al.* 1995:105).

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THE EFFECTIVENESS OF SENSORY STIMULATION THERAPY TO STRENGTHEN THE WELL-BEING OF OPERATING ROOM NURSES

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AUTHORSHIP

"I have participated sufficiently in the conception and design of this work, the data analysis, and the writing of this article to take public responsibility for it. I have reviewed the final version of the article and approve it for submission for possible publication".



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Dear Marietjie

Ethics Application: NWU-00036-11-S1 (M.P. Koen & E. du plessis)

The applicants responded in a satisfactory way to the comments made by the panel members.

Ethical approval is recommended.

Yours sincerely

A handwritten signature in cursive script, reading 'Este (H.H.) Vorster'.

Prof. H.H. Vorster

Private Bag X6001, Potchefstroom

South Africa 2520

Tel: 018 299-1111/2222

Web: <http://www.nwu.ac.za>

To whom it may concern

Date: May 2012

Dear

CONFIRMATION OF ETHICAL CLEARANCE

Regarding the project: The effectiveness of sensory stimulation therapy to strengthen the well-being of operating room nurses.

Supervisor: Dr. E. du Plessis

Co-supervisor: Prof. M.P. Koen

This research will focus on the effect of sensory stimulation therapy on the well-being of operating room personnel in a Private Hospital in the North West Province.

Objectives of the study include the following:

- To explore and describe OR nurses' needs for SST in a Private Hospital in the North West.
- To explore and describe OR nurses suggestions regarding the implementation of SST in an OR environment in the North West.
- To explore and describe the effectiveness of a SST intervention in strengthening the resilience of OR nurses in a Private Hospital in the North West.

This research is a sub-study in an overarching research project, entitled: *Strengthening the research of health caregivers and risk groups*, with ethical clearance from the Ethics Committee of the North-West University (Ref no NWU-00036-11-S1). The co-investigators are Prof MP Koen and Dr E du Plessis.

Background information: Strengthening the resilience of health caregivers and risk groups

The co-investigators identified the problem that the resilience of health caregivers as well as risk groups should be strengthened by means of a comprehensive, multi-faceted approach and that research should be conducted on how resilience of health caregivers and risk groups can be strengthened by means of such an approach. The purpose of the research is thus to develop a comprehensive, multi-faceted approach to strengthen the resilience of health caregivers as well as risk groups. We intend to reach this purpose through the following objectives:

- To explore and describe the resilience of health caregivers and risk groups
- To implement and validate strategies developed by Koen, Van Eeden and Wissing (2010c) to strengthen resilience of professional nurses and other health caregivers and risk groups
- To explore and describe faith community nursing as intervention to strengthen the resilience of health caregivers and risk groups
- To explore and describe sensory stimulation as intervention to strengthen the resilience of health caregivers and risk groups

To achieve these objectives, it is necessary to explore and describe various health caregivers and risk groups. Within this overarching research project, Chantal Marais intends to focus on the well-being of operating room nurses in a Private Hospital in the North West Province. Nurses are viewed as risk groups in terms of their well-being, and, in line with the objectives of the overarching research project, there is a need to explore and describe their resilience, in order to formulate recommendations to strengthen their resilience and overall well-being. The results of this sub-study will contribute to reaching the objectives of the overarching project with more recommendations that can be implemented in other nursing departments where the well-being and resilience of nurses needs to be strengthened. We therefore confirm that the sub-study of Chantal Marais is covered by the above-mentioned ethical clearance.

Yours sincerely

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DECLARATION OF LANGUAGE EDITING

Completed by Gerda Fourie:

I, **Gerda Susarah Fourie**, ID No. 580910 0017 008 5, hereby declare that I edited the M.Cur dissertation of **C Marais** with the title "*The effectiveness of sensory stimulation therapy to strengthen the well-being of operating room nurses*".

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ABSTRACT

Highly skilled nurses amongst the OR team, are needed in the operating room (OR) to ensure optimal patient safety. Shortages in experienced OR nurses and a stressful working environment prove to have a negative influence on effective safe patient care as well as a negative effect on nurses' own well-being.

The research focused on the effectiveness of sensory stimulation therapy (SST) to strengthen the well-being of nurses in the OR of a private hospital in the North-West Province. SST, better known as Snoezelen™, is a blend of sight, sounds, textures, aromas and motion providing stimulation to the primary senses (Collier, McPherson, *et al.*, 2010:698). The five primary senses are gently stimulated without any intellectual activity needed. A particular aim with SST is to improve the well-being of individuals by setting them at ease.

The well-being of OR nurses was studied from a resilience viewpoint assuming that, if exposure to stressors was limited and the individual did have an opportunity to recover, stressors may have a positive, toughening effect. Well-being and resilience was used interchangeably in the study. The objectives of the study were to explore and describe OR nurses' needs for SST, to explore and describe OR nurses' suggestions with regard to the implementation of SST in an OR and to explore and describe the effectiveness of a SST intervention to strengthen the well-being of OR nurses in a private hospital in the North-West Province.

An explorative, descriptive quasi-experimental design within a quantitative approach was used. Seventy two participants from two private hospitals in the North-West Province voluntarily participated in the research. A pre-/post-test design was used. One pilot group, one intervention group and one comparison group were identified. Participants from all three the participating groups completed a self administered resilience scale questionnaire before and after the implementation of a SST intervention. Before the intervention 100% participants from the pilot group, 100% participants from the intervention group and 96% participants from the comparison group completed the self administered resilience scale questionnaire. Participants of the intervention group also completed a self report questionnaire from which their needs could be determined and suggestions were made on the implementation of a SST intervention. A 98% response rate was obtained for these self report questionnaires. After the intervention the intervention group's participants were invited to write narratives regarding their experiences after visiting the SST room.

The intervention was implemented for a period of two consecutive months in the OR of one of the private hospitals. After the intervention an 88% response rate from the pilot group, 100% response rate from the intervention group and a 63% response rate from the comparison group, completing self administered resilience scale questionnaires, were obtained. Data was analysed with the assistance of a statistical consultant at the North-West University in Potchefstroom by using STATISTICA (version 10) and SPSS (version 20, release 20.0.0) (StatSoft Inc., 2011, SPSS Inc., 211). Results indicated that there was no statistical difference between the three participating groups regarding their resilience before the intervention. However, after the intervention, the intervention group demonstrated a statistical increase in their resilience levels.

Based on these results, as well as on conclusions of relevant literature and the feedback from participants in their written narratives, recommendations were formulated with regard to nursing education, nursing practice and further research. Briefly it means that there should be more consideration for OR nurses' well-being by means of a SST program providing for their needs. Recommendations included the benefits of a SST room in a hospital environment as well as complete instructions on how to create and to furnish such a room. Attributes of resilience, factors influencing resilience levels and methods to increase resilience levels in the workplace should be included in a regular in-service training program. For future research the researcher recommended further studies in order to determine the resilience levels in various departments of private hospitals. This could mean the successful implementation of a SST room in other departments as well which will eventually lead to the improved well-being of all nursing staff. The researcher is willing to act as a consultant if the need arises for the comparison groups to implement a SST intervention in their different departments.

Key words: Nurse, operating room, resilience, sensory stimulation therapy, well-being

OPSOMMING

Hoogs bekwame verpleegpersoneel word in die teater benodig ten einde optimale veiligheid van pasiënte te verseker. Daar is bewys dat 'n tekort aan ervare teaterverpleegpersoneel en 'n stresvolle werksomgewing die effektiwiteit van pasiëntesorg beïnvloed. Dit is ongeag van die negatiewe uitwerking wat dit op teaterverpleegpersoneel se persoonlike welstand het.

Die navorsingstudie was gefokus op die uitwerking wat sensoriese stimulasie terapie (SST) het om die welstand van teaterverpleegpersoneel in 'n privaat hospitaal in die Noord-Wes Provinsie te versterk. SST, beter bekend as Snoezelen™, is 'n samevoeging van klanke, teksture, aromas en beweging wat stimulasie voorsien aan die vyf primêre sintuie (Collier, McPherson, *et al.*, 2010:698). Die vyf primêre sintuie word sagkuns gestimuleer sonder dat enige intellektuele aktiwiteit nodig is. Die primêre doel van SST is om die welstand van die individu te verbeter deur hul gerus te stel.

Teaterverpleegpersoneel se welstand was vanuit 'n veerkragtigheidsoogpunt beskou wat veronderstel dat, indien blootstelling aan stressors beperk word en die individu 'n geleentheid kry om van spanning te herstel, dit positief en versterkend kan wees. Welstand en veerkragtigheid was gelykwaardig gedurende die studie. Die doelwitte van die studie was om teaterverpleegpersoneel se behoefte aan SST te bepaal en te omskryf, om teaterverpleegpersoneel se voorstelle met betrekking tot die implementering van SST in die teater te bepaal en te omskryf, en om die effektiwiteit van 'n SST intervensie te bepaal en te omskryf ten einde die welstand van teaterverpleegpersoneel in 'n privaat hospitaal in die Noord-Wes Provinsie te versterk.

Daar was van 'n ondersoekende, beskrywende kwasi-eksperimentele ontwerp binne 'n kwantitatiewe benadering gebruik gemaak. Twee-en-sewentig deelnemers van twee privaat hospitale in die Noord-Wes Provinsie het vrywillig aan die navorsing deelgeneem. Die ontwerp het 'n voorafgaande sowel as 'n opeenvolgende toets behels. Een loodsstudiegroep, een intervensiegroep en een vergelykende groep was geïdentifiseer. Deelnemers het voor en na die implementering van 'n SST intervensie 'n selfgeadministreerde vraelys ten opsigte van veerkragtigheid ingevul. Voor die intervensie, het 100% deelnemers van die loodsstudiegroep, 100% deelnemers van die intervensiegroep en 96% deelnemers van die vergelykende groep die selfgeadministreerde veerkragtigheidsvraelys voltooi. Deelnemers van die intervensiegroep het ook 'n persoonlike verslaggewende vraelys voltooi waarvolgens hul

behoefte bepaal kon word en aanbevelings vir die implimentering van 'n SST intervensie gemaak is. Voltooide persoonlike verslaggewende vraelyste wat terug ontvang was vanaf die intervensie groep was 98%. Na die intervensie is deelnemers van die intervensie groep versoek om hul eie ondervindinge in die SST kamer te in 'n kort verhaal te skryf.

Die intervensie was vir 'n tydperk van twee opeenvolgende maande in die teater van een van die privaat hospitale geïmplementeer. Na die intervensie het 88% van die loodstudiegroep, 100% van die intervensiegroep en 63% van die vergelykende groep die veerkrachtigheidsvraelyste voltooi. Data was met die hulp van 'n statistieke konsultant verbonde aan die Noord-Wes Universiteit in Potchefstroom deur middel van STATISTICA (weergawe 10) en SPSS (weergawe 20, vrystelling 20.0.0) geanaliseer (StatSoft Inc., 2011, SPSS Inc., 2011). Resultate het aangedui dat daar voor die intervensie geen statistieke verskille tussen die drie deelnemende groepe se veerkrachtigheid was nie. Die intervensiegroep se veerkrachtigheidsvlak het egter ná die intervensie merkwaardig verhoog.

Aanbevelings was op grond van die uitslae sowel as gevolgtrekkings van toepaslike literatuur en die geskrewe verhale van die intervensie groep vir verpleegopleiding, verpleging in die praktyk en verdere navorsing gemaak. Kortliks beteken dit dat daar meer begrip vir teaterverpleegpersoneel se welstand moet wees deur die implementering van 'n sensoriese stimulasie terapie program wat in hul behoeftes voorsien. Aanbevelings behels die voordele van 'n SST-kamer in 'n hospitaalomgewing, asook volledige aanwysings om die kamer in te rig. Kenmerke van veerkrachtigheid, faktore wat veerkrachtigheidsvlakke beïnvloed en metodes om veerkrachtigheidsvlakke in die werksplek te verhoog, moet by 'n gereelde indiens opleidingsprogram ingesluit word. Die navorser het verdere studies vir toekomstige navorsing met betrekking tot die bepaling van veerkrachtigheidsvlakke in onderskeie afdelings in privaat hospitale aanbeveel. Dit kan aanleiding tot die suksesvolle implementering van 'n SST-kamer in ander afdelings gee, wat uiteindelik alle verpleegpersoneel se welstand kan verbeter. Die navorser is beskikbaar om ook op te tree as konsultant indien die vergelykende groepe ook 'n behoefte aandui om 'n SST intervensie in hul betrokke afdelings te implimenter.

Kernkonsepte: Operasiesaal, sensoriese stimulasie terapie, veerkrachtigheid, verpleegster, welstand

BACKGROUND

Nurses in general report stress predominantly related to illnesses and burnout (Firth-Cozens, 2001:215-222; Tummers *et al.* 2002:183-206) due to increased work-load, high health risks in terms of infectious diseases, confrontations with death and suffering, poor communication and social support, shift work and emotional demands (Firth-Cozens, 2001:215-222; Pisanti *et al.* 2003:523-536). In a report from the Commonwealth of Australia the same high working demands in nursing were identified, including frequent schedule changes and the lack of appreciation by superiors and colleagues (Productivity Commission, 2005:58-59).

Research regarding high working demands was presented at the International Council of Nurses' (ICN) 24th Quadrennial Congress in which 2 000 nurses participated in a global survey on challenges and opportunities. Participating countries included Brazil, Canada, Colombia, Japan, Kenya, South Africa, Taiwan, Uganda, the United Kingdom and the United States. As much as 46% of the nurses confirmed that the work-load is currently worse compared to the previous five years, which has an impact on the quality of patient care. The most concerning factors for participants in the study were heavy work-load (42%), insufficient benefits and salaries (22%), lack of recognition (15%) and too much bureaucracy (13%) (International Centre for Human Resources in Nursing (ICHRN), 2009:3-4). Sufficient staff, involvement in decision-making and a balanced work-life can significantly contribute towards the well-being of nurses and a fulfilled nursing career (ICHRN, 2009:3-4).

Recent studies on the public health sector in South Africa have shown that the main determinants for increased job dissatisfaction and impaired well-being are high work-load, limited resources, negative working conditions, emotional climates in departments, an unsatisfactory work environment and a shortage of nurses (Bester & Engelbrecht, 2009:104-117; Hall, 2004:28-36; Kekana *et al.* 2007:24-35; Nyathi & Jooste, 2008:28-37; Uys *et al.* 2004:50-56). In a similar survey completed by Van der Westhuizen (2008:1-69), 60% of nurses in the private sector indicated that they want to leave the profession. Reasons for leaving included insufficient salaries, excessive work-load, limited career advancement, ineffective management, safety concerns and patient overloads (Van der Westhuizen, 2008:8-22). Dissatisfied employees may cause or passively allow conditions to worsen. This can lead to insufficient patient care, decrease in efforts, increased error

and shortages in nursing staff (Robbins, 1996:196-197). Thus, it is evident that all these factors contribute to high levels of stress in nursing.

Contributing factors to stress also include the amount of inexperienced nurses (Gillespie *et al.* 2007:427-438), stress of working with too many patients (Hegney *et al.* 2006:1521-1530), spending insufficient time with patients in need (Boykin *et al.* 2003:223), making life changing decisions in limited time (Egan, 1993:109-125), continuous contact with other members of the multi-professional team who are also severely stressed, and conflict situations with colleagues (Skovholt, 2001). Staff shortages is rated the most stressful regarding nursing demands with excessive administrative duties next in line (Van der Colff & Rothmann, 2009:1-10). The well-being of nurses experiencing high levels of stress is at risk, especially in highly specialised departments.

The operating room (OR) can be defined as a specialised department in the hospital. Specialised nursing areas are complex departments, especially due to the unique stressors associated with those specific areas. Physician abuse, poor communication, overlapped responsibilities, ethical problems, perceived aggressive behaviour between OR personnel, emotional labour and teamwork problems are unique stressors in the OR leading to job dissatisfaction, a decrease in the well-being of nurses and insufficient patient care (Coe & Gould, 2008:609-618; Higgins & MacIntosh, 2010:321-327; Katz, 2007:152-158; Timmons & Tanner, 2005:85-91). As a result of high patient demands and high stressful work-load, competent skilled trained registered nurses in specialised departments need to be retained. At the end of 2011, only 2 459 of 22 788 registered nurses in SA were trained in operating room nursing (South African Nursing Council (SANC), 2011:1).

As the OR relies on highly skilled nurses for optimal patient safety it can indeed be identified as one of the most stressful departments in healthcare (Gillespie & Kermode, 2003:24-33). From the researcher's own experience as a professional trained theatre nurse, shortages in experienced nurses and a stressful work environment do have an influence on effective safe patient care. Due to inadequate skilled theatre nurses, highly skilled and qualified nurses have to take some of the unskilled theatre nurses work-load of which the result is that patient safety demands cannot be fully complied to. High stress levels, burnout, sleep deprivation and bad working relationships are some of the negative effects OR nurses experience as a result of these extra responsibilities (Coe & Gould, 2008:609-618; Higgins & MacIntosh, 2010:321-327; Katz, 2007:152-158; Timmons & Tanner, 2005:85-91). Thus, OR nurses are exposed to a higher risk to stress and a low morale which can influence their own well-being negatively.

The current situation of OR nurses emphasises the need for a positive working environment. According to Rondeau and Francescutti (2005:327-340), a positive working environment can be defined as settings that support excellence, quality patient care, health, safety and the personal well-being of staff. It also enhances employees and organisation's motivation, productivity and performance. Identified characteristics of a positive environment include the following: health and safety policies for employees, fair work-load and job demands, good support to peers, employees taking part in decisions, shared values, work schedules permitting a good balance between work and personal life, equal opportunities, safe staffing levels and management support to employees (ICN, International Hospital Federation, *et al.*, 2008). A work environment benefits from these characteristics, which include: higher employee retention rates, improved teamwork, continuous safe patient care, improved patient outcomes, strong interpersonal relationships, a decrease in absenteeism and turnover rates, employees feel respected and valued for their work, and it enhances effective teamwork (Lowe, 2002:49-56; Wheelen, Burchill, *et al.*, 2003:527-534; Work Foundation, 2007). These identified factors affect the work environment and are essential to improve interventions. On the other hand, negative conditions can have the opposite effect.

Decreasing nurse numbers, increasing work-load and incompetencies contribute to a stressful and negative working environment. Consequently, it influences patients and nurses negatively (Registered Nurses Association of Ontario (RNAO), 2006:1-139). Long working hours with extreme job demands definitely affect employee's personal relationships, their sick profile, conflict management and job satisfaction, leading to high turnover rates (International Council of Nurses *et al.* 2008). Furthermore, case management, documentation and other administrative duties challenge health professional's time available for hands on patient care (Physiotherapy Association of British Columbia, 2007).

Thus, there is a need for a deeper insight and understanding of the well-being of nurses remaining in the operating room despite of difficult work conditions. The well-being of OR nurses may be studied from a resilience viewpoint. The term well-being and resilience will thus be used interchangeably. Resilience is a dynamic process in which the individual positively adapts to adversity or risk (Friedli, 2009:1-64; Herrman, Saxena, *et al.*, 2005; Masten & Reed, 2005:74-88). After a stressful event the resilient individual has the capacity to rebound and maintain a healthy outcome (Rutter, 2007:205-209; Silver, 2009:343). Absence of resilience can cause ongoing psychological distress (Bonanno, 2004:20-28). In contrast, if exposure to stressors is limited and the individual has an opportunity to recover, stressors can have a positive, toughening effect (Dienstbier,

1989:84-100). Aspects of resilience are hope, optimism, coping, self efficacy, sense of coherence, mental health and well-being (Koen, Van Eeden, *et al.*, 2011a:2). In studies completed by Koen *et al.* (2011a:1-11; 2011b:103-120), it is indicated that professional nurses with higher levels of resilience reflect these characteristics and that they can cope with daily stressors. This positive feature of well-being derives from positive psychology.

The positive psychology movement has identified resilience as a multi-faceted factor which enables an individual to bounce back and thrive during difficult circumstances (Keyes, 2007:95-108; Seligman & Csikszentmihalyi, 2000:5-14). Martin Seligman identified the need for a psychological study about individual creativity, resilience, optimism and lastly, happiness. This was when the positive psychology movement was established. Positive psychology is a scientific study about strength, well-being, resilience and optimal functioning (Duckworth *et al.* 2005:631; Wong, 2011:72) with the aim to understand the factors allowing individuals, communities and societies to thrive (Fredrickson, 2001:218-226; Seligman & Csikszentmihalyi, 2000:5-14). Positive psychology focuses on positive emotions such as happiness, gratitude and fulfillment; positive individual traits such as optimism, resilience and character strengths; positive relationships among groups and enables institutions to foster positive outcomes (Gable & Haidt, 2005:103-110; Linley & Joseph, 2004:3-14; Peterson, 2006; Peterson & Seligman, 2003:14-27; Seligman, 2002; Seligman & Csikszentmihalyi, 2000:5-14; Seligman *et al.* 2005:410-421). The same is said about nursing. According to Vander Zyl (2002:4) the work of nurses has to be meaningful to them before they can take responsibility for the improvement of patient's well-being. If nurses cannot cope with all the stressors in their workplace, it is likely that their entire lives will be effected negatively (Cilliers, 2002:61-85) which can lead to insufficient patient care. Therefore, strategies need to be implemented to counteract these negative effects (Valent, 1995:21-50), and to strengthen positive emotions.

These emotions include positive subjective experiences from the past, present and future, including satisfaction, well-being, happiness and constructive thoughts of optimism and hope (Seligman, 2003:xvi). Positive emotions play an important role in positive psychology as far as the promotion of resilience is concerned (Fredrickson, 2001:218-226). According to the Broaden and Build theory, positive emotions broaden people's curiosity, creativity, exploration and play, and foster physical, intellectual and social resources for optimal functioning. Negative emotions are adapted in a short period of time, whilst long term effects result from frequent positive emotions, and build personal resources for continued growth (Fredrickson, 1998:300-319; Fredrickson, 2001:218-226; Fredrickson, 2005:120-134). The latter has a positive influence on resilience.

People with high levels of resilience experience more positive emotions and recover quicker from stressors (Fredrickson, 1998:300-319; Fredrickson, 2001:218-226; Fredrickson, 2005:120-134). Positive emotions such as creativity, bravery, kindness, tenacity and optimism increase resilience (Seligman, 2002). Efficacy of resilience can take place within persons (coping and optimism), among persons (social support) and across social levels (educational systems) (Masten & Reed, 2005:74-88). The following approaches in positive psychology can improve resilience:

- Change in “explanatory style”: Day-to-day events and interaction between colleagues can be interpreted differently (Buchanan & Seligman, 1995; Friedli, 2009:1-64; Reivich & Shatte, 2002; Seligman, 1998).
- Learning skills enhancing optimistic thoughts and positive reactions to improve resilience (Seligman, 1998, Friedli, 2009:1-64).
- Skills based on learned optimism, include: To challenge beliefs, to avoid thinking traps, to be calm and focused and to put things into perspective (Kobau *et al.* 2011:3). These skills promote mental health and equip the individual with techniques to avoid excessive worries and to prevent spirals of negative thoughts (Reivich & Shatte, 2002; Seligman, 1998).
- Appreciative Inquiry: This is a process managers of organisations can follow by focusing on positive assumptions about people, their organisation, their employees and relationships (Cooperrider *et al.* 2003). The focus once placed on problem solving is now on the strengths of a group, thus providing a positive change (Cooperrider *et al.* 2003, Ludema *et al.* 2003).

According to Seligman and Csikszentmihalyi (2000:7) "a science of positive, subjective experience, positive individual traits, and positive institutions promises to improve the quality of life and prevents the pathologies that arise when life is barren and meaningless". Further studies focusing on resilience must stress the importance of interventions to promote competence (Friedli, 2009; Yates & Masten, 2004:521-539).

Part of a multi-faceted, comprehensive strategy to strengthen resilience may be sensory stimulation therapy (SST) which contributes to a positive work environment (Koen & Du Plessis, 2011). SST, better known as Snoezelen™, is a blend of sight, sounds, textures, aromas and motion providing stimulation to the primary senses (Collier *et al.* 2010:698). The five primary senses are gently stimulated without any intellectual activity needed. A particular aim with SST is to improve the well-being of individuals by setting them at ease.

SST can be implemented to help improve the following needs: stress management and relaxation, psychiatry, management of chronic pain, mother and child care and dementia care. SST can be created according to individual needs, in any suitable area and by any member of the multi-professional team (Bailon *et al.* 2002:444-452; Bera, 2008:1-3; Collier *et al.* 2010:698-703; Van Weert *et al.* 2006:656-668). The use of this therapy may make a huge contribution to the well-being of OR personnel working in a cold and clinical atmosphere. Individual needs of OR nurses should be explored after which a suitable area in the OR complex can be identified to create a multi-sensorial environment. Currently SST research broadly focuses on neurology (Dang-Vu *et al.* 2010:R626-R627; Korosi & Baram, 2009:1-8), and the intellectually disabled person (Asher *et al.* 2010:E25-26, Fava & Strauss, 2010:160-171). However, there is currently a lack in research about SST in an OR as part of an approach to strengthen resilience.

From this discussion it becomes clear that the health and well-being of OR nurses might be at risk, leading to possible low standards of quality patient care. A comprehensive, multi-faceted approach and process is necessary to strengthen their resilience, in this case that of OR nurses in a private hospital in the North-West Province. Such an approach is in collaboration with an already existing research project, namely the RISE project. The purpose of RISE is to develop a comprehensive, multi-faceted approach to strengthen the resilience of health care givers as well as risk groups including professional nurses.

PURPOSE AND OBJECTIVES

The purpose of the study was to determine the effectiveness of SST as an intervention to strengthen the well-being of OR nurses in a private hospital in the North-West Province.

The following objectives were formulated in the study:

1. To explore and describe OR nurses' needs for SST in a private hospital in the North-West Province.
2. To explore and describe OR nurses' suggestions with regard to the implementation of a SST in an OR environment in a private hospital in the North-West Province.
3. To explore and describe the effectiveness of a SST intervention to strengthen the resilience of OR nurses in a private hospital in the North-West Province.

RESEARCH DESIGN

An explorative descriptive quasi-experimental, pre-/post-test design is applied in the study. A SST intervention without randomisation is applied. An explorative descriptive quantitative design, as in this case, focuses on the incidence, size and measurable attributes of the phenomena (Polit & Beck, 2012:18). This design is very practical and ensures some research control when full rigour is not possible (Polit & Beck, 2012:222).

RESEARCH METHOD

Research population and sampling

The research population included professional trained theatre nurses, professional nurses, enrolled staff nurses and auxiliary nurses working in the OR and intensive care unit (ICU) of two private hospitals in the North-West Province. An all-inclusive sample was used. A pilot, intervention and comparison group was specified for the population. The pilot group included eight (n=8) OR nurses, the intervention group included forty one (n=41) OR nurses and the comparison group included twenty three (n=23) ICU nurses. The intervention group and the comparison group were situated in the same private hospital. Collected data from the pilot group was included in the collected data from the comparison group. Altogether seventy two (n=72) literate participants, i.e. who could read and write English, voluntarily participated in the study.

Measuring instruments

The researcher collected pre- and post-intervention data from both the intervention and comparison groups to evaluate the impact of the intervention and to rule out threats of internal validity (Christensen *et al.* 2011:241; Polit & Beck, 2012:217). The researcher distributed a self administering resilience scale questionnaire amongst both groups, as well as a self-report questionnaire amongst the intervention group, with clear completion instructions. Before completing the questionnaires, participants had to read and sign consent forms for voluntary participation. Seventy two (72) resilience scale questionnaires were handed out for the pre-test of which seventy one (71) were returned. Thus, 71 (99%) questionnaires were analysed. There was 100% feedback on the distributed forty one (41) questionnaires to an interventional group, and thirty (30) of the thirty one (31) questionnaires distributed amongst the comparison group were returned. During the post-test, sixty four (64) resilience scale questionnaires were distributed amongst the

intervention and comparison groups and fifty six (56) questionnaires were returned. Thus, 88% questionnaires were analysed in the post-test.

A self administered resilience scale questionnaire, created by Wagnild and Young (1993:165-178) was completed by both the intervention and comparison groups. The resilience scale questionnaire measures the resilience of individuals. Questions are scored on a 7 point scale, ranging from 1 = disagree to 7 = agree. Final scores on the resilience scale can vary between 25 and 175. The higher the score, the more resilient an individual is. The following are various resilience levels: 25-100 very low, 101-115 low, 116-130 moderate low, 131-145 moderate high, 145-160 high and 161-175 very high (Wagnild & Young,1993). The resilience of participants was evaluated in the pre-test, i.e. before the implementation of the intervention. Pre-tests reported a good internal consistency with a Cronbach alpha coefficient of .88.

The most effective method to determine the intervention group's needs and suggestions with regard to SST was by means of a self-report questionnaire containing open and close-ended questions. The self-report questionnaire was developed by the researcher and handed out personally only to the interventional group before the intervention was implemented. Forty one (41) self-report questionnaires were distributed during the pre-test. Forty (98%) self-report questionnaires were received back to be analysed.

Thus, questionnaires were appropriate to determine the level of participants' resilience as well as to identify their needs, suggestions and perceptions regarding SST.

Research procedure

Ethical permission was granted to the study, which formed part of the RISE study with ethical clearance from the Ethics Committee of the North-West University (Ref. No. NWU-00036-11-S1). Written consent was also obtained from the Management of the two private hospitals as well as from participants in the research. The first author presented the intended research project to the Management of the two private hospitals as well as to all participants of different departments in order to obtain permission.

Before collecting any data, the researcher conducted information sessions with the pilot, intervention and comparison groups to inform them about the planned study, sensory stimulation therapy and data collecting methods.

A pilot study was done to identify any unclear recommendations with regard to the completion of the resilience scale questionnaire. Eight participants participated in the pilot

study who did not suggest any adaptations. Thus, the resilience scale questionnaire was feasible, reliable, valid and useable.

Collected data from the pilot study was similar to that of the comparison group and could thus be included as data from the comparison group.

After pre-test data was collected by means of the resilience questionnaire (pilot group, intervention group and comparison group) and the self-report questionnaire (intervention group), findings of objectives one and two were as follow. A SST intervention was implemented (intervention group) on a consecutive basis of two months. According to individual needs and suggestions of the intervention group as well as according to a literature review, the sensory stimulation room was designed and implemented in the OR where the intervention group was situated. The researcher identified individual needs and suggestions for SST by means of the completed self-report questionnaire. Participants mostly had the same individual needs and suggestions and the room was equipped accordingly. Identified needs and suggestions in the self-report questionnaire are illustrated in Diagram A.

****Include: Diagram A****

The sensory stimulation room was equipped with the following stimulating equipment: Bean bags and a massage chair to stimulate tactile senses, bubble tubes, laser optics, fiber optics and a disco ball continuously reflecting against the walls and mirror stimulating individuals' visual and tactile senses. It also included a nature wall unit with calm and relaxing effects to stimulate visual senses; aroma therapy with different aromas to stimulate the olfactory senses and soft, calming background music stimulating the auditory senses. Coffee, tea and sweet savouries were provided occasionally to stimulate participant's taste senses. Dim lighting in the room had a relaxed and calm effect. The following pictures illustrate the SST used in this study.

****Include: Pictures****

The use of the SST room was monitored by means of an anonymous attendance list. Each participant reported their visit to the SST room by writing the date and time spent in the room under their anonymous code on the attendance list. Participant's codes were only known by themselves and the researcher. OR nurses visited the SST room three hundred and ninety six (396) times during the two consecutive months. The most visits by one participant were twenty five (25) times and the least visits were naught (0) due to

resignation and sinus reactions caused by the aroma therapy. The most time spent in the SST room was approximately thirty (30) minutes.

After two consecutive months post test data was collected from the intervention and comparison groups. Both groups completed the resilience scale questionnaire. The intervention group was requested to write a short narrative on their experience in the SST room, in order to enrich results. These narratives were analysed by means of thematic coding. Diagram B illustrates themes of the narratives.

****Include: Diagram B****

Statistical analysis

A statistical consultant at the North-West University in Potchefstroom assisted the researcher with the analyses of the data by means of STATISTICA (version 10) and SPSS (version 20, released 20.0.0) programs (StatSoft Inc., 2011; SPSS Inc., 2011).

Descriptive statistics were used to analyse pre- and post-test data. Graphs represented the frequency of OR and ICU nurses before and after the intervention. The Cronbach alpha reliability coefficients and Clark and Watson's inter-item correlation coefficient (Clark & Watson, 1995:309-319; Cronbach, 1951:297-334) determined the internal consistency and reliability of scales.

The internal consistency of a set of items is an indicator of how well the items measure the same variable or construct. A Cronbach alpha of more than .70 or higher is evident that each item on the questionnaire is consistently measuring a single construct (Christensen *et al.* 2011:144; Nunnally, 1978:245-246). "Interrelated items may be summed to obtain an overall score for each participant. Cronbach's coefficient alpha estimates the reliability of this type of scale by determining the internal consistency of the test or the average correlation of items within the test" (Nunnally, 1978:295). According to Clark and Watson (1995) the average inter-item correlation should fall somewhere between .15 and .50. In this case the Cronbach alpha score was .875 and the inter-item coefficient score was .232.

Before the intervention the different resilience levels of the groups were measured with ANOVA. ANOVA compares the statistical significance between two or more groups (Christensen *et al.* 2011:441).

The strength of the relationship between the variables was analysed by means of Cohen's *d* effect size indicator before and after the intervention. Cohen's criteria can be interpreted as $d = .2$ = small, $d = .5$ = medium and $d = .8$ = large (Christensen *et al.* 2011:406; Cohen, 1988:20-27).

A dependent t-test applied to each group in order to compare the method between the groups before and after the intervention. If the p values are bigger than 0.05 there will be no significant change. If the p value is smaller than 0.05 there will be definite change.

To compare the method between the groups after the intervention an ANCOVA test was used where results were controlled for pre-resilience scores.

Results

Needs and suggestions

Participants of the intervention group all indicated that they have never participated in a SST intervention before and it will be a first time experience to them. All the participants identified the same area for implementation of the SST room in the OR. Similar needs and suggestions were indicated by the participants of the intervention group. Suggestions regarding equipment to be included in the SST room included equipment that stimulates the five primary senses.

****See Diagram: A****

Descriptive statistics, internal consistency and reliability

Participants of all three groups were females with an average age of 43, and a standard deviation of 10.23. The minimum age of participants was 21 and the maximum age 64. According to a p value of 0.29 there was no significant difference in age. In the pilot group the average age of participants was 48 with a standard deviation of 10.49. The average age of the comparison group was 44 with a standard deviation of 8.34 and the average age of the intervention group was 42 with a standard deviation of 10.91. The health of participants before the intervention was overall good. 21% of participants' health was excellent, 17% of participants' health was very good, 49% of participants' health was good and 13% of participants' health was fair. Results before the intervention indicated that 30% of participants never felt depressed whilst 6% of participants felt depressed all the time. 29% of participants indicated that they sometimes felt depressed and 35% frequently felt depressed.

****Include: Table 1****

After the completion of the resilience questionnaire Cronbach's reliability coefficient was .875 with an average inter-item correlation of .232, indicating that the resilience questionnaire was reliable. Therefore, the researcher did not discuss individual items, but the total resilience of all three participating groups. Before the intervention the average resilience of all three participating groups was 137.83 with a standard deviation of 15.17 and a minimum of 99 and a maximum of 172. According to this study all three participating groups demonstrated moderate high levels of resilience. After the intervention the average resilience of all three participating groups was 142.27 with a standard deviation of 14.85 and a minimum of 96 and a maximum of 174. Thus, it reflects moderate high levels of resilience.

Statistical significance

According to the results of ANOVA and Cohen's *d* coefficient there is no meaningful statistical difference with regard to the pilot, comparison and intervention group's resilience pre-test. A p-value of .647 confirms this result.

Wagnild and Young (1993) differentiate various levels of resilience before the intervention, as stated in Table 3.

****Include: Table 2****

****Include: Table 3****

****Include: Table 4****

A Spearman Rank Order Correlation of -0.03 was used to determine whether age had an effect on resilience, which indicates that the correlation between age and resilience was not statistically or practically important.

****Include: Table 5****

After the intervention each group's dependent t-test on increased resilience contained the following results: In the pilot group, who did not participate in the intervention, participant's average resilience was 140.50 with a standard deviation of 15.18, a p-value of 0.87 and an effect size of 0.05. This indicates that there was no statistical improvement in the pilot group's resilience. In the comparison group, who also did not participate in the intervention, the participants' average resilience was 135.86 with a standard deviation of

11.27, a p-value of 0.44 and a small effect size of 0.22, indicating that there was no statistical improvement in the comparison group's resilience. In the intervention group participants' average resilience was 146.36 with a standard deviation of 13.95, a p-value of 0.00 and a big effect size of 0.79, indicating a significant statistical increase in the intervention group's resilience.

Include: Table 6

Include: Graph 1

Results of ANOVA on post-test controlling for pre-test differences indicated that there were no statistically significant differences between the participating groups.

Include: Table 7

Discussion

The purpose of the study was to determine the effectiveness of SST as an intervention to strengthen the well-being of OR nurses in a private hospital in the North-West Province. The objectives of the study were to explore and to describe OR nurses' needs for SST, OR nurses' suggestions with regard to the implementation of SST and to explore and to describe the effectiveness of a SST intervention in order to strengthen the resilience of OR nurses in a private hospital in the North-West Province. Collected data and observation enabled the researcher to make several conclusions.

According to relevant literature nurses are generally exposed to high levels of stress in their working environment. There is also a global shortage of nurses, especially in specialised departments, such as the OR. It was evident that, due to a high workload, daily exposure to stressors and nursing shortages, nurse's well-being was not noticed. Literature contained insufficient information about interventions to improve the well-being of nurses, especially in the OR. As a trained professional theatre nurse, the researcher noticed this gap in nursing and the need to explore the well-being of nurses in the OR. Nurse's well-being was studied from a resilience viewpoint. Well-being and resilience were used interchangeably.

According to literature, resilience is a dynamic process in which the individual can bounce back in difficult circumstances and maintain a healthy outcome. Relevant literature indicated that nurses with a higher level of resilience has characteristics including hope, optimism, coping, self efficacy, sense of coherence, mental health and well-being

The researcher explored and described SST as an intervention to increase the well-being of OR nurses and to retain trained, experienced nurses in a private hospital in the North-West Province. According to literature, the aim of SST is to improve the well-being of individuals by setting them at ease without any intellectual activity needed.

According to OR nurses there was definitely a need for the implementation of a SST intervention in the OR due to a high workload, shortage of experienced nurses and high turnover rates leading to decreasing resilience levels. None of the participants was familiar with SST and neither did they ever participate in a SST intervention. SST was a total new experience to participants in the intervention group. Stimulation of participant's five primary senses in a relaxed and calm atmosphere increased their resilience levels and improved their well-being. The consequence was higher levels of hope, optimism, coping, self-efficacy and a sense of coherence – all characteristics of resilience (Koen *et al.* 2011a:2).

It was a positive experience for most of the participants who participated in the SST intervention, especially when they could spend time in the SST room. Sometimes the time was limited due to the nature and amount of theatre procedures. Decreased stress levels, relaxation between cases, willingness to return positively to work conditions and increased resilience levels were reported after visits to the SST room. One participant described her experience in the SST room as a total escape from all the stress and high work demands. Her tension was relieved as soon as she smelled the welcoming aromas of fruit flavours. She felt relaxed, stimulated and welcome in the SST room where her mind was refreshed with positive thoughts.

Participants reported that the equipment used, according to their specific needs and suggestions, were sufficient. Although limited space allowed only a few visitors at a time, it still complied with the requirements for a SST room. Recommendations for a SST room provide for one participant at a time, but due to the nature of the specific department a maximum of three participants could visit the room. Participant's needs were mostly the same in this study. Therefore, it was possible for more than one participant to visit the room at the same time.

The measuring instrument used in this study was highly reliable. A resilience scale questionnaire was used to determine participant's resilience levels before and after the implementation of the intervention. The researcher identified intensive care nurses to participate in the study due to the fact that they experience the same high stress levels, high workload and high turnover rate. There was no statistical difference in resilience

levels before the intervention between the intervention and comparison groups. However, after the intervention there was definitely a statistical increase in the intervention group's resilience. Thus, it indicated that participation in a SST intervention will strengthen the well-being of OR nurses in a private hospital in the North-West Province.

Conclusion

Limitations

Limitations of this study included the following:

- The researcher had difficulty to distribute questionnaires in the ICU before the intervention due to the different shifts participants work, including night shift.
- After the intervention a relatively small amount of participants in ICU completed the questionnaires and the researcher struggled to get the completed questionnaires back. Reasons were leave, maternity leave, resignations, different shifts and the long period that passed after the first questionnaire.
- The implementation of the intervention was very expensive due to the fact that the researcher had to take all the different needs of participants into consideration and a variety of equipment had to be purchased.
- A shortcoming in the self-report questionnaire was the indication of any allergies for aroma therapy.
- The aroma therapy as part of the SST intervention had a negative effect on some of the participants, causing sinus irritation, preventing them from using the SST room.
- Participants could not visit the SST room every day due to a busy schedule in the OR.
- Individual visits to a SST room are ideal to stimulate individual needs. It was not possible in the OR due to the number of nursing personnel. A maximum number of three participants could visit the room at the same time. Most of the participants in the OR had the same identified needs, making it possible that they could visit the SST room simultaneously.
- A relatively small sample participated in the study. Therefore, the findings cannot be generalised to operating room nurses in other parts of South Africa.

- Due to many influencing factors it is difficult to measure resilience. Therefore, the researcher exclusively used a reliable questionnaire for this purpose.

Recommendations

The study was undertaken to strengthen the well-being of operating room nurses through the implementation of a SST intervention. Recommendations for nursing practice, nursing education and future nursing research are made.

Recommendations for future practice

The focus of managing the well-being of operating room nurses should be on the mental, physical and emotional needs of the individual. Through the findings of this study a program to care for the caregiver can be implemented in the OR as well as in other departments of the hospital. The increase in the resilience of nursing personnel can lead to a healthy workforce and improve safe and quality patient care. Recommendations on how to create and implement a SST room in the OR follows:

In congruence with the findings and in line with relevant literature, the following are recommendations on how to create and implement a SST room in a hospital environment:

- SST can be implemented to improve stress management, relaxation and the well-being of nurses in the OR. Health Service Management should therefore consider implementing SST in OR in order to strengthen the well-being of nurses.
- Any member of the multi-professional team can implement the SST room.
- The need for a SST room in the OR department as well as the different individual needs of OR nurses regarding SST should first be identified by completing a self-report questionnaire, similar to the one designed by the researcher.
- ****Include: Self-report questionnaire****
- The self-report questionnaire should include specific open and closed ended questions with regard to SST.
- It should be a suitable, easy accessible area for all OR nurses.

- The SST room should preferably accommodate one individual at a time, but if OR nurses' needs are mostly the same, as in this study, the room should be big enough to accommodate not more than three individuals at the same time.
- The SST room has to be designed according to OR nurses' specific needs.
- The aim of a SST room is to stimulate the five primary senses and to ensure a relaxed atmosphere. It should therefore be ensured that all five senses – visual, taste, olfactory, auditory and tactile senses are represented in the SST room and that individual needs are identified and adhered to accordingly as well as that no intellectual activity is needed.
- There should be enough equipment to stimulate all specific needs of participants at a given time in case more than one participant use the room.
- If aroma therapy is applied in the implementation of a SST room, it should be used with sensitivity, especially if the room accommodates more than one participant at a time. It is suggested that aroma therapy flavours are used according to participants' needs. Participants should indicate their needs regarding aroma therapy in a self-report questionnaire.
- Information sessions with regard to the use of the SST room should be held on a regular basis to remind OR nurses about the aim of the implementation of such room in the specific OR department.
- Equipment in the SST room can be rearranged and changed on a weekly basis to give the room a more interesting and relaxed appearance.
- The intervention room should be monitored with an attendance list to determine feasibility, especially in an OR department.

In addition, regular in-service training sessions are recommended regarding factors that influence resilience levels and how to increase resilience levels in the work place. Different departments in the private hospital can submit recommendations on how to increase employees' resilience levels.

Recommendations for future research in this field include:

- Explore healthy work environments in different departments in the private hospital.
- Further research on nurses' resilience levels in the hospital can be meaningful.

- Different attributes of resilience and factors influencing resilience levels in the hospital need to be investigated.
- The need for further implementation of SST rooms in the hospital has to be explored.
- A study regarding the reasons why nursing professionals leave the OR in private hospitals is recommended.

Included are pictures of the SST room designed and implemented in this study to give the reader a visual idea regarding the design of a SST room (Appendix H).

Recommendation for nursing education

SST can be included in the curricula of nursing students when learning about nursing management and measures to strengthen the well-being of staff. Regular informal in-service training sessions can focus more on the improvement of the well-being of nurses. Different attributes of resilience should be included in training sessions where the influence of several factors on resilience levels as well as methods to increase nurse's resilience levels in the workplace can be discussed. It is recommended that the involved departments in this study and other departments in private hospitals meet interactively to improve the current well-being of nursing personnel by implementing an in-service training program containing recommendations to improve nurse's resilience in different departments on a regular basis. Nursing personnel should find enough time to establish a balance between work and a healthy well-being.

Recommendations for future research

The following is recommended for future research in this field:

- A healthy work environment in different departments in the private hospital should be explored.
- Further research on resilience levels of nurses in the private as well as in public hospitals can be meaningful.
- Different attributes of resilience and factors influencing resilience levels in the hospital need to be investigated.
- The need for further implementation of SST rooms in the hospital need to be explored.

- A study regarding the reasons why nursing professionals leave the OR in private hospitals is recommended.

In congruence with the objectives and the results of the study, it can be concluded that participating in SST will strengthen the well-being and increase the resilience of OR nurses in a private hospital. The researcher's hypotheses support this assumption. Significant recommendations for nursing practice, education and research could be made.



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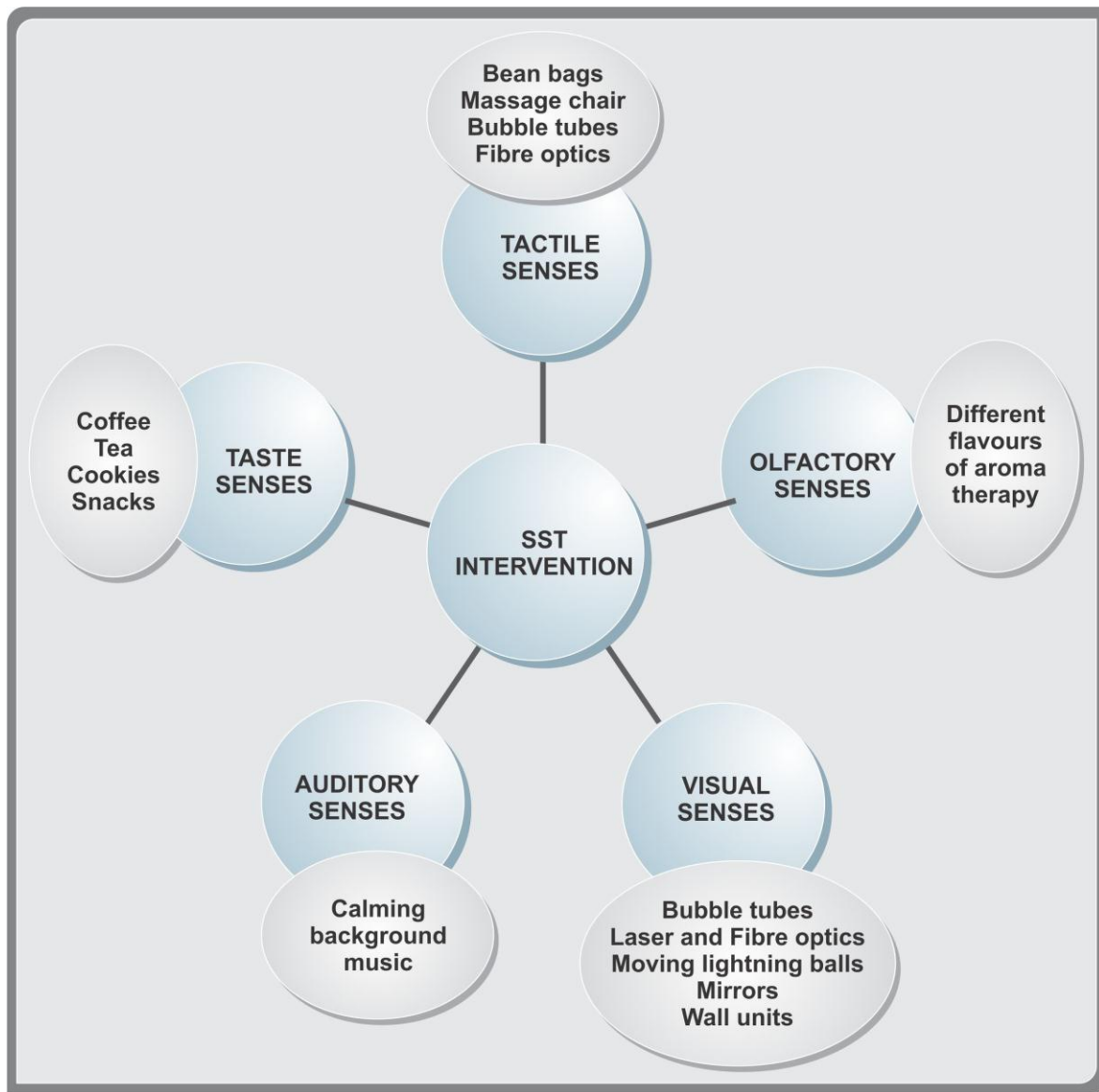


DIAGRAM A: INTERVENTION GROUP PARTICIPANT'S INDIVIDUAL NEEDS AND SUGGESTIONS FOR SST INTERVENTION

PICTURES: SENSORY STIMULATION ROOM IN THE OR

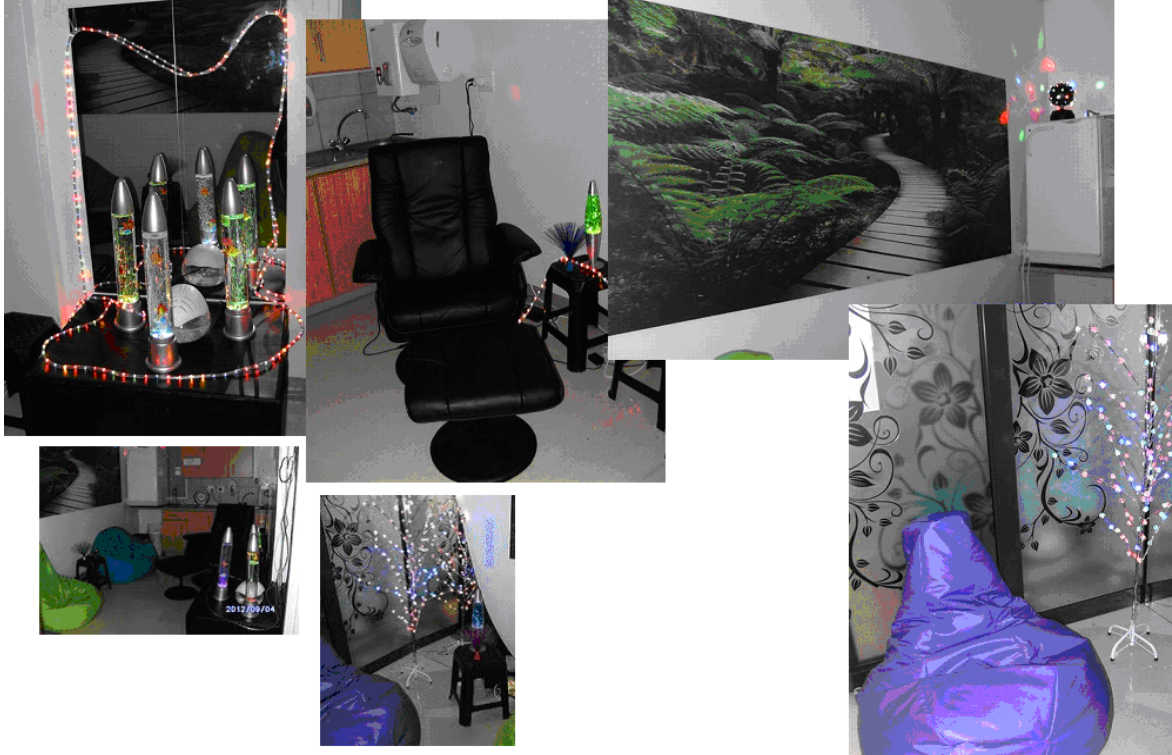


DIAGRAM B: THEMES IDENTIFIED FROM NARRATIVES

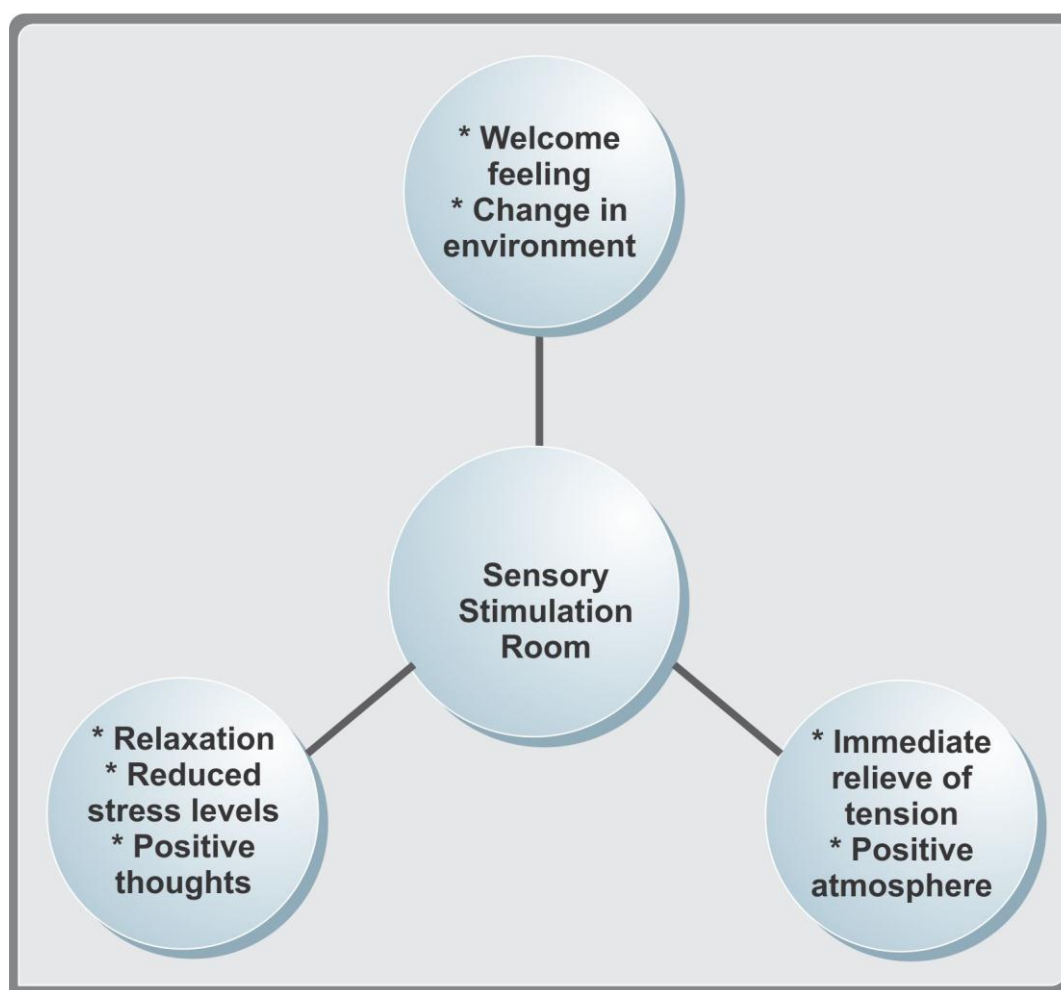


Table 1: Descriptive statistics – age, health, depression and resilience

Variable	Valid amount of participants who indicated their age	Mean	Minimum	Maximum	Standard Deviation
Age	68	43.07	21	64	10.23

Variable	Valid	Frequency	Valid Percentage
Health	Excellent (1)	15	21.1
	Very good (2)	12	17
	Good (3)	35	49.3
	Fair (4)	9	13

Variable	Valid	Frequency	Valid Percentage
Depressed	Never feels depressed (1)	21	30.4
	Sometimes feels depressed (2)	20	29.0
	Frequently feels depressed (3)	24	35
	Feels depressed all the time (4)	4	6

Variable	Valid amount of participants	Mean	Minimum	Maximum	Standard Deviation
Resilience before the intervention	71	137.83	99.00	172.00	15.17

Table 2: Cronbach's alpha reliability coefficient – before intervention

Group	Mean	Standard Deviation	Cronbach alpha	Standardised alpha	Averag inter-item correlation
Pilot	138.9	18.2	.9	.9	.4
Intervention	137	14.7	.9	.9	.2
Comparison	139	17	.9	.9	.3
All groups	137.7	15.5	.88	.88	.23

Table 3: Various resilience levels according to Wagnild and Young's (1987) resilience scale questionnaire

Very Low	Low	Mod. Low	Mod. High	High	Very High
25 - 100	101 - 115	116 - 130	131 - 145	145 - 160	161 - 175

Table 4: Results of ANOVA on pre-test of resilience – Cohens *d* coefficient

Group	Mean	Standard Deviation	p value	Effect size	
				Pilot with	Comparison with
Pilot	141.42	18.33			
Comparison	138.98	15.98		0.13	
Intervention	136.50	14.30		0.27	0.16
Total	137.82	15.17	.647		

Table 5: Spearman Rank Order Correlation

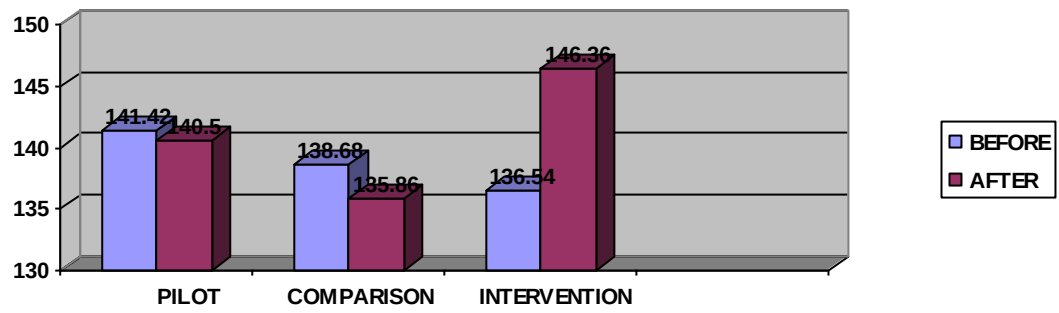
Variable	Age	Resilience
Age	1.00	-0.03
Resilience	-0.03	1.00

Table 6: Dependent t-test in each group on increase in resilience

GROUP – PILOT				
Variable	Mean	Standard Deviation	p value	Effect size
Resilience 2	140.50	15.18		
Resilience	141.42	18.33	0.87	0.05

GROUP – COMPARISON				
Variable	Mean	Standard Deviation	p value	Effect size
Resilience 2	135.86	11.27		
Resilience	138.68	12.80	0.44	0.22

GROUP – INTERVENTION				
Variable	Mean	Standard Deviation	p value	Effect size
Resilience 2	146.36	13.95		
Resilience	136.54	12.50	0.00	0.79



GRAPH 1: RESILIENCE LEVELS BEFORE AND AFTER INTERVENTION OF DIFFERENT PARTICIPATING GROUPS

Table 7: ANCOVA post-test controlling for pre-test differences

Group	Resilience 2 Mean	Resilience 2 Standard Error	p value	Effect size
Pilot	139.08	4.06		0.75
Comparison	135.97	3.30		1.02
Intervention	147.67	1.93		0.27
Total			0.647	

SELF-REPORT QUESTIONNAIRE – DESIGNED BY THE RESEARCHER

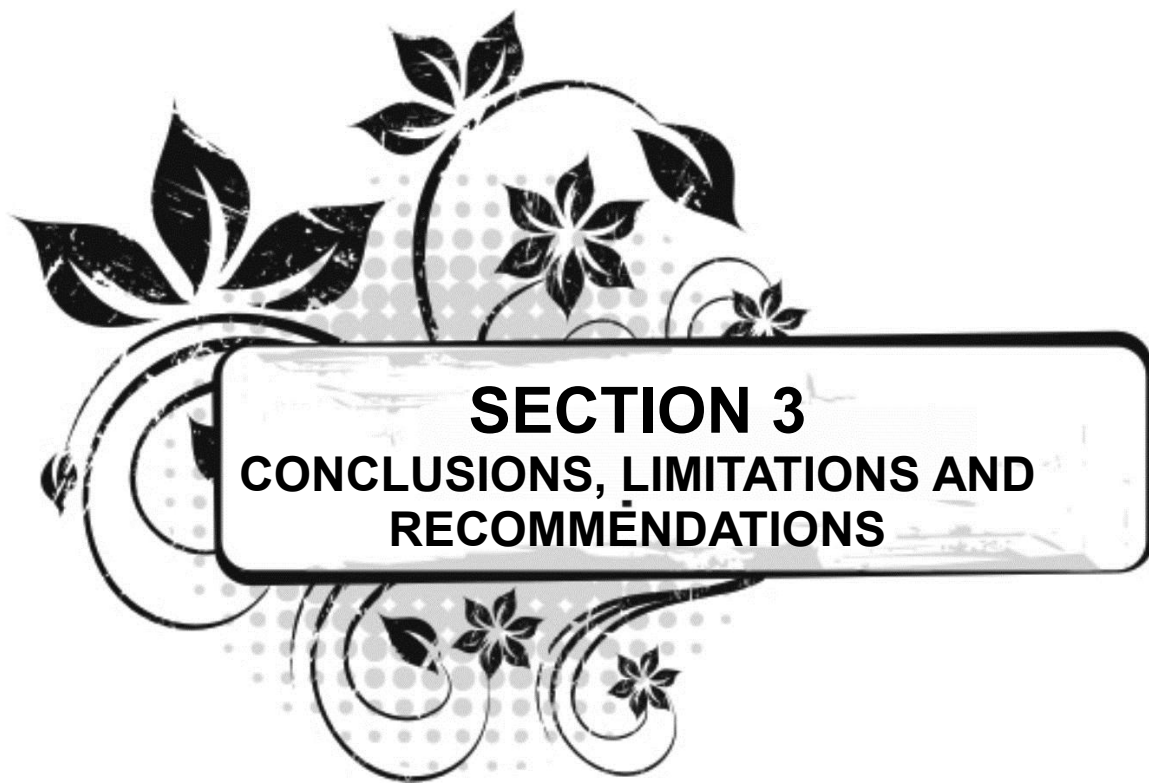
SELF REPORT QUESTIONNAIRE	
Research study: The effectiveness of Sensory Stimulation Therapy on strengthening the well-being of operating room nurses.	
Date: _____	Participant's number: _____
• Please complete all questions honestly • All information will be kept anonymous	
Questions	
1. In your opinion, what do you think Sensory Stimulation Therapy (SST) involves?	

2. Have you ever participated in Sensory Stimulation Therapy? Yes ☐ No ☐	
If you answered yes, what did you gain from participating in the Sensory Stimulation Therapy?	

3. Do you think there is a need to implement Sensory Stimulation Therapy in the operating room?	
Yes ☐ No ☐	
If you answered yes, where in the operating room do you suggest will be a suitable area for implementation?	

4. What would you like to be included into a Sensory Stimulation Therapy area?	

Thank you for your participation and quick response.	



SECTION 3
CONCLUSIONS, LIMITATIONS AND
RECOMMENDATIONS

CONCLUSIONS, LIMITATIONS AND RECOMMENDATIONS

1. INTRODUCTION

In the previous section the research was discussed in article format, consisting of the research purpose and objectives, the research design, the research method, statistical analysis, results and the statistical significance of the study. Although relevant literature was limited, it confirmed the implementation methods of a SST room and contributed to the findings from the research study. These findings confirmed that, if OR nurses participate in SST, their well-being might be strengthened. Thus, from the research study, the researcher identified the need to propose recommendations on how to improve OR nurses' well-being with the implementation of a SST room in a private hospital environment. Section three consists of the conclusions, limitations and recommendations derived from this study, followed by the researcher's experiences during the study.

2. CONCLUSIONS

Findings of the study together with relevant literature were considered as the overall conclusions related to the objectives of the study.

2.1 Literature conclusions

From the literature review, a great deal was written globally regarding high workload, job dissatisfaction and reasons why nurses leave the profession. It is evident that remaining nurses experience high stress levels, which lead to a huge setback in healthcare due to shortages of experienced nurses. Most of the research regarding the well-being of nurses focused on factors contributing to high levels of stress, including the amount of inexperienced nurses, handling too many patients, not spending enough time with patients in need and conflict situations with colleagues. Literature with regard to unique stressors in specialised departments, such as the OR, was easily available and it was concluded

that the well-being of nurses in specialised departments was at risk, leading to a literature review with regard to positive working environment.

In congruence with Kumpfer's resilience framework, the qualities of a positive work environment have been identified in literature and it remains a fact, a positive work environment play a positive role in the well-being of nurses. Positive aspects like coping and problem solving skills to increase the well-being of nurses have been studied, but there is still a need to study the well-being of OR nurses remaining despite difficult work conditions.

The researcher studied the well-being of OR nurses from a resilience viewpoint. There is sufficient literature on resilience in children and young people, but not on resilience in nursing personnel, especially OR nurses. Positive psychology defines resilience as a multi-faceted factor, enabling individuals to bounce back in difficult circumstances. Studied literature identifies approaches to improve resilience, although a key factor regarding the well-being of OR nurses have not been explored yet, especially with regard to the implementation of a SST room in the OR department to strengthen the resilience of OR nurses.

Although there is useful theoretical information on the implementation of this specific strategy, the current focus is on neurology and the intellectually disabled person. Thus, no previous research was done with regard to the implementation of a SST room in an OR department to strengthen the resilience of nurses.

The literature review aimed at gaining more information on resilience and SST for a design of a SST intervention to strengthen the resilience of OR nurses. Job dissatisfaction, well-being of OR nurses from a resilience viewpoint and SST were specific themes discussed in literature.

2.2 Empirical conclusions

According to the objectives a quantitative approach was used in this study enriched with qualitative narratives. The Wagnild and Young resilience scale questionnaire used in the pre- and post-test to measure resilience levels of the participating groups, was reliable and valid. A self-report questionnaire completed in the pre-test contained qualitative data. Very valuable data with recurrent themes was used to implement a SST room in the OR department according to the needs and suggestions of each participant in the study. Narratives written by participants in the intervention group contributed positively to the study. Participant's experiences of the SST room were in concordance with the findings

and the information added reliability to the study. The method used in this study is recommended for further research in other departments of the hospital, including other specialised departments with regard to nurse's resilience.

2.2.1 Conclusions from results and discussion

The purpose of this study was to determine the effectiveness of SST to strengthen the well-being of OR nurses in a private hospital in the North-West Province. The objectives of the study were to explore and to describe the needs and suggestions for a SST room in the OR department and to explore and describe the resilience levels of OR nurses before and after the intervention. The research question of the study was: Can the well-being of OR nurses be strengthened by means of SST? The researcher formulated a central theoretical statement for guidance: Understanding of the effectiveness of SST as intervention to strengthen the well-being of OR nurses in a private hospital in the North-West Province as well as insight into OR nurse's needs and suggestions for SST will lead to the recommendations for the implementation of this therapy as intervention to strengthen OR nurses' well-being. The researcher could make several conclusions from collected data, results and the discussion.

The completed resilience scale questionnaires and self-report questionnaires identified a definite need for SST in the OR department of a private hospital in the North-West Province. None of the participants in the intervention group was familiar with SST and it was a total new experience for them. The researcher selected Intensive Care nurses to participate in the study as one of the comparison groups. The conclusion was that Intensive Care nurses experience the same high stress levels as OR nurses.

Participants in the intervention group experienced visits to the SST room very positively. Stimulation of participant's five primary senses in a relaxed and calm atmosphere increased their resilience levels and improved their well-being. Time to visit the SST room was sometimes limited due to the nature and amount of theatre procedures. Participants reported that visits to the SST room decreased stress levels, made relaxation between cases possible, enhanced the feeling to return positively to work conditions and increased their resilience levels. One participant described her experience in the SST room as a total escape from all the stress and high work demands she experienced. It relieved her tension as soon as she smelled the welcoming aromas of fruit flavours. She felt relaxed, stimulated and welcome in the SST room and her mind was refreshed with positive thoughts.

Participants verbally confirmed that equipment in the SST room satisfied their needs. Limited space allowed only three participants to visit the room simultaneously. In this study participant's needs were mostly the same so that it was possible for more than one participant to visit the room at the same time

A resilience scale questionnaire compiled by Wagnild and Young (1993) was used to determine participant's resilience levels before and after the implementation of the intervention. The conclusion from statistics of the study was that the resilience scale questionnaire demonstrated high levels of internal consistency and reliability, as previous studies proved (Abiola & Udofia, 2011:1-5, Ahern, Kiehl, *et al.*, 2006:103-125, Hasui, Igarashi, *et al.*, 2009:15-22, Koen, Van Eeden, *et al.*, 2011a:1-11).

Participants of all three participating groups indicated moderate high levels of resilience (Wagnild & Young, 1993) before the intervention, although all three participating groups were exposed to high levels of stress. There was no statistical difference in resilience levels before the intervention between the intervention and the comparison groups. However, the intervention group demonstrated a definite statistical increase in resilience after the intervention. Thus, participation in a SST intervention strengthened the well-being of OR nurses.

Objectives were achieved by completing resilience scale questionnaires by participants from the pilot, intervention and comparison group before and after the intervention and the completion of a self-report questionnaire by participants of the intervention group before the intervention. A few participants in the intervention group wrote narratives about their experiences in the SST room with the conclusion that participation in SST contributed to their well-being in the OR.

In congruence with the results and objectives of the study, the researcher concluded that participating in SST will strengthen the well-being of OR nurses in a private hospital. This assumption fully supported the researcher's hypotheses. Thus, the null hypothesis of the researcher was rejected.

3. LIMITATIONS OF THE STUDY

Limitations of this study included the following:

- The researcher had difficulty to distribute questionnaires in the ICU before the intervention due to the different shifts participants work, including night shift.

- After the intervention a relatively small amount of participants in ICU completed the questionnaires and the researcher struggled to get the completed questionnaires back. Reasons were leave, maternity leave, resignations, different shifts and the long period that passed after the first questionnaire.
- The implementation of the intervention was very expensive due to the fact that the researcher had to take all the different needs of participants into consideration and a variety of equipment had to be purchased.
- A shortcoming in the self-report questionnaire was the indication of any allergies for aroma therapy.
- The aroma therapy as part of the SST intervention had a negative effect on some of the participants, causing sinus irritation, preventing them from using the SST room.
- Participants could not visit the SST room every day due to a busy schedule in the OR.
- Individual visits to a SST room are ideal to stimulate individual needs. It was not possible in the OR due to the number of nursing personnel. A maximum number of three participants could visit the room at the same time. Most of the participants in the OR had the same identified needs, making it possible that they could visit the SST room simultaneously.
- A relatively small sample participated in the study. Therefore, the findings cannot be generalised to operating room nurses in other parts of South Africa.
- Due to many influencing factors it is difficult to measure resilience. Therefore, the researcher exclusively used a reliable questionnaire for this purpose.

4. RECOMMENDATIONS

The study was undertaken to strengthen the well-being of operating room nurses through the implementation of a SST intervention. Recommendations for nursing practice, nursing education and future nursing research are made.

4.1 Recommendations for nursing practice

The focus of managing the well-being of operating room nurses should be on the mental, physical and emotional needs of the individual. Through the findings of this study a

program to care for the caregiver can be implemented in the OR as well as in other departments of the hospital. The increase in the resilience of nursing personnel can lead to a healthy workforce and improve safe and quality patient care. Recommendations on how to create and implement a SST room in the OR follows:

In congruence with the findings and in line with relevant literature, the following are recommendations on how to create and implement a SST room in a hospital environment:

- SST can be implemented to improve stress management, relaxation and the well-being of nurses in the OR. Health Service Management should therefore consider implementing SST in OR in order to strengthen the well-being of nurses.
- Any member of the multi-professional team can implement the SST room.
- The need for a SST room in the OR department as well as the different individual needs of OR nurses regarding SST should first be identified by completing a self-report questionnaire, similar to the one designed by the researcher.
- ****Include: Self-report questionnaire****
- The self-report questionnaire should include specific open and closed ended questions with regard to SST.
- It should be a suitable, easy accessible area for all OR nurses.
- The SST room should preferably accommodate one individual at a time, but if OR nurses' needs are mostly the same, as in this study, the room should be big enough to accommodate not more than three individuals at the same time.
- The SST room has to be designed according to OR nurses' specific needs.
- The aim of a SST room is to stimulate the five primary senses and to ensure a relaxed atmosphere. It should therefore be ensured that all five senses – visual, taste, olfactory, auditory and tactile senses are represented in the SST room and that individual needs are identified and adhered to accordingly as well as that no intellectual activity is needed.
- There should be enough equipment to stimulate all specific needs of participants at a given time in case more than one participant use the room.
- If aroma therapy is applied in the implementation of a SST room, it should be used with sensitivity, especially if the room accommodates more than one participant at a time. It is suggested that aroma therapy flavours are used

according to participants' needs. Participants should indicate their needs regarding aroma therapy in a self-report questionnaire.

- Information sessions with regard to the use of the SST room should be held on a regular basis to remind OR nurses about the aim of the implementation of such room in the specific OR department.
- Equipment in the SST room can be rearranged and changed on a weekly basis to give the room a more interesting and relaxed appearance.
- The intervention room should be monitored with an attendance list to determine feasibility, especially in an OR department.

In addition, regular in-service training sessions are recommended regarding factors that influence resilience levels and how to increase resilience levels in the work place. Different departments in the private hospital can submit recommendations on how to increase employees' resilience levels.

Recommendations for future research in this field include:

- Explore healthy work environments in different departments in the private hospital.
- Further research on nurses' resilience levels in the hospital can be meaningful.
- Different attributes of resilience and factors influencing resilience levels in the hospital need to be investigated.
- The need for further implementation of SST rooms in the hospital has to be explored.
- A study regarding the reasons why nursing professionals leave the OR in private hospitals is recommended.

Included are pictures of the SST room designed and implemented in this study to give the reader a visual idea regarding the design of a SST room (Appendix H).

4.2 Recommendations for nursing education

SST can be included in the curricula of nursing students when learning about nursing management and measures to strengthen the well-being of staff. Regular informal in-service training sessions can focus more on the improvement of the well-being of nurses.

Different attributes of resilience should be included in training sessions where the influence of several factors on resilience levels as well as methods to increase nurse's resilience levels in the workplace can be discussed. It is recommended that the involved departments in this study and other departments in private hospitals meet interactively to improve the current well-being of nursing personnel by implementing an in-service training program containing recommendations to improve nurse's resilience in different departments on a regular basis. Nursing personnel should find enough time to establish a balance between work and a healthy well-being.

4.3 Recommendations for future research

The following is recommended for future research in this field:

- A healthy work environment in different departments in the private hospital should be explored.
- Further research on resilience levels of nurses in the private as well as in the public hospitals can be meaningful.
- Different attributes of resilience and factors influencing resilience levels in the hospital need to be investigated.
- The need for further implementation of SST rooms in the hospital need to be explored.
- A study regarding the reasons why nursing professionals leave the OR in private hospitals is recommended.

5. CONCLUSION BY THE RESEARCHER

The researcher identified a unique problem in the OR: The well-being of OR nurses. The well-being of OR nurse is often neglected, leaving the profession with a big crisis, namely that qualified, experienced OR nurses are leaving the profession. It can be concluded that for this research, by exploring and describing the effectiveness of SST to strengthen the well-being of OR nurses, that the resilience of a group OR nurses increased. Thus, the outcome of this study can be used to improve the well-being of OR nurses leading to improved quality patient care. Finally, the objectives of this study have been achieved.

6. REFLECTION BY THE RESEARCHER

My journey with this study reflected on my own experiences as a trained professional theatre nurse, realising that I also experienced most of the mentioned stressors and frustrations that OR nurses currently experience. That led to the specific study to help my colleagues to strengthen their own well-being as well as to retain them to ensure optimal safe patient care.

My colleagues inspired me to do this study, because although they work under high stressful conditions and challenges every day, they still strive to give their best to ensure quality patient care.

I am fortunate to still be in practice to implement the obtained knowledge and skills that I have gained during this study and to consult and help other departments in the hospital on how to implement the same intervention to lead to improve the well-being of the entire nursing staff in the hospital.

Spending time with the participants and working with them in the OR, observing their daily challenges and high stress levels, made me just more aware of their need to look after their own well-being and to present useful guidelines to other departments for the implementation of a SST room to improve their own well-being. These guidelines are set to empower OR nurse's with the necessary skills to increase and maintain high levels of resilience that will improve their own well-being.

I enjoyed the research journey, especially the implementation of the SST room in the OR department. I am satisfied with the results and final outcome. SST does have a positive effect on the resilience of OR nurses. I hope that the implementation of the SST room in the OR will contribute to each participant's future.



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APPENDIX A



The Resilience Scale™

Date completed: _____

Participation number: _____

How Resilient Are You?

*The highest level of education I have attained:

*My age:

*My gender:

☐ Female

☐ Male

The Resilience Scale™ (RS™)

Please read the following statements. To the right of each you will find seven numbers, ranging from "1" (Strongly Disagree) on the left to "7" (Strongly Agree) on the right. Click the circle below the number which best indicates your feelings about that statement. For example, if you strongly disagree with a statement, click the circle below "1". If you are neutral, click "4", and if you strongly agree, click "7", etc. You must answer every question to submit the test for scoring.

		Strongly Disagree		Strongly Agree				
		1	2	3	4	5	6	7
1. When I make plans, I follow through with them.	☐	☐	☐	☐	☐	☐	☐	☐
2. I usually manage one way or another.	☐	☐	☐	☐	☐	☐	☐	☐
3. I am able to depend on myself more than anyone else.	☐	☐	☐	☐	☐	☐	☐	☐
4. Keeping interested in things is important to me.	☐	☐	☐	☐	☐	☐	☐	☐
5. I can be on my own if I have to.	☐	☐	☐	☐	☐	☐	☐	☐
6. I feel proud that I have accomplished things in life.	☐	☐	☐	☐	☐	☐	☐	☐
7. I usually take things in stride.	☐	☐	☐	☐	☐	☐	☐	☐
8. I am friends with myself.	☐	☐	☐	☐	☐	☐	☐	☐
9. I feel that I can handle many things at a time.	☐	☐	☐	☐	☐	☐	☐	☐
10. I am determined.	☐	☐	☐	☐	☐	☐	☐	☐
11. I seldom wonder what the point of it all is.	☐	☐	☐	☐	☐	☐	☐	☐
12. I take things one day at a time.	☐	☐	☐	☐	☐	☐	☐	☐

- | | | | | | | | |
|---|---|---|---|---|---|---|---|
| 13. I can get through difficult times because I've experienced difficulty before. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 14. I have self-discipline. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 15. I keep interested in things. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 16. I can usually find something to laugh about. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 17. My belief in myself gets me through hard times. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 18. In an emergency, I'm someone people can generally rely on. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 19. I can usually look at a situation in a number of ways. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 20. Sometimes I make myself do things whether I want to or not. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 21. My life has meaning. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 22. I do not dwell on things that I can't do anything about. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 23. When I'm in a difficult situation, I can usually find my way out of it. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 24. I have enough energy to do what I have to do. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 25. It's okay if there are people who don't like me. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |

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*I have felt depressed in the past 2 weeks: ☐ Never ☐ Sometimes the time ☐ Frequently ☐ All the time

*I rate my health as generally: ☐ Excellent ☐ Very Good ☐ Good ☐ Fair ☐ Poor

*I am at my ideal body weight: (±5 pounds) ☐ Yes ☐ No

*I exercise 30 minutes or more most days: ☐ Yes ☐ No

*I eat a healthy diet most days: (with 5 fruits/vegetables) ☐ Yes ☐ No

*I DO NOT use tobacco products: (smoke, chew, or dip) ☐ Yes ☐ No

I have FEW or NO alcoholic drinks: (*female: 1/day, male: 1 or 2/day) ☐ Yes ☐ No



APPENDIX B



SELF REPORT QUESTIONNAIRE

Research study: The effectiveness of Sensory Stimulation Therapy on strengthening the well-being of operating room nurses.

Date: _____

Participant's number: _____

- Please complete all questions honestly
- All information will be kept anonymous

Questions

1. In your opinion, what do you think Sensory Stimulation Therapy (SST) involves?

2. Have you ever participated in Sensory Stimulation Therapy? Yes ☐ No ☐

If you answered yes, what did you gain from participating in the Sensory Stimulation Therapy?

3. Do you think there is a need to implement Sensory Stimulation Therapy in the operating room?

Yes ☐ No ☐

If you answered yes, where in the operating room do you suggest will be a suitable area for implementation?

4. What would you like to be included into a Sensory Stimulation Therapy area?

Thank you for your participation and quick response.



APPENDIX C



Anonymous control list

6080	1997	9093	2756	85410	2910	0709	1234	1466	2102	7201	8110	5804	8205	1966
2/7 10min	2/7 10min	2/7 10min	7min 5/7		3/7 5min		4/7/12 5min	2/7/12 10min	2-7-2012 10min	4/7/2012 10min	3-7-12 10min	4/7/12 10min	3/7/12 10min	10min
5/7 10min	5/7 10min	3/7 5min	2/7 20min		4/7 10min		4/7/12 5min	3/7/12 10min	4/7/2012 15min	4/7/12 10min	3-7-12 10min	4/7/12 10min	10min	20min
9/7 20min	9/7 20min	5/7 5min	25/7 12		5/7 20min		11/7/12 15min	5/7/12 15min	11-7-2012 15min	2/7/12 10min	3-7-12 5min	6/7/12 10min	2/7/12 10min	20min
9/7 20min	9/7 20min	9/7 5min			11/7 20min			16/7/12 20min	9-7-2012 5min	11/7/12 10min	5-7-12 15min	9/7/12 10min	11/7/12 10min	13/6/12 10min
12/7 10min	12/7 10min	11/7 10min			12/7 30min		25/7/12 20min	25/7/12 20min	15/7/2012 5min		24-7-12 15min	11/7/12 10min	11/7/12 5min	17/7 10min
13/7 5min	13/7 5min	16/7 10min			17/7 30min				17/1/2012 20min			12/7/12 8min	12/7/12 5min	10min
17/7 13min	17/7 13min	18/7 10min			23/7 30min				19-7-2012 10min			16/7 30min	12/7/12 10min	10min
									19-7-2012 30min			17/7 20min	12/7/12 10min	10min
									20/7-2012 20min			19/7 20min	17/7/12 10min	15min
									20/7-2012 5min			20/7/12 10min	18/7/12 10min	20min
									25/7-2012 15min			20/7/12 10min	18/7/12 10min	25/7-2012 10min
												23/7/12 20min		
												24/7/12 20min		
												25/7/12 30min		



APPENDIX D





NORTH-WEST UNIVERSITY
YUNIBESITHI YA BOKONE-BOPHIRIMA
NOORDWES-UNIVERSITEIT
POTCHEFSTROOMKAMPUS

Tel: (018) 299-1111/2222
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Faculty of Health Sciences

Tel: (018) 299 4237

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E-mail: Este.Vorster@nwu.ac.za

13 May 2011

Dear Marietjie

ETHICS APPLICATION: NWU-00036-11-S1 (M.P. KOEN & E. DU PLESSIS)

The applicants responded in a satisfactory way to the comments made by the panel members.

Ethical approval is recommended.

Yours sincerely

A handwritten signature in cursive script, reading 'Este (H.H.) Vorster'.

Prof. H.H. Vorster

Private Bag X6001, Potchefstroom

South Africa 2520

Tel: 018 299-1111/2222

Web: <http://www.nwu.ac.za>

Date: May 2012

Mrs. Marietjie Halgryn

To whom it may concern

Dear

CONFIRMATION OF ETHICAL CLEARANCE

Regarding the project: The effectiveness of sensory stimulation therapy to strengthen the well-being of operating room nurses.

Supervisor: Dr. E. du Plessis

Co-supervisor: Prof. M.P. Koen

This research will focus on the effect of sensory stimulation therapy on the well-being of operating room personnel in a Private Hospital in the North West Province.

Objectives of the study include the following:

- To explore and describe OR nurses' needs for SST in a Private Hospital in the North West.
- To explore and describe OR nurses suggestions regarding the implementation of SST in an OR environment in the North West.
- To explore and describe the effectiveness of a SST intervention in strengthening the resilience of OR nurses in a Private Hospital in the North West.

This research is a sub-study in an overarching research project, entitled: *Strengthening the research of health caregivers and risk group*, with ethical clearance from the Ethics Committee of the North-West University (Ref no NWU-00036-11-S1). The co-investigators are Prof MP Koen and Dr E du Plessis.

Background information: Strengthening the resilience of health caregivers and risk groups

The co-investigators identified the problem that the resilience of health caregivers as well as risk groups should be strengthened by means of a comprehensive, multi-faceted approach and that research should be conducted on how resilience of health caregivers and risk groups can be strengthened by means of such an approach. The purpose of the research is thus to develop a comprehensive, multi-faceted approach to strengthen the resilience of health caregivers as well as risk groups. We intend to reach this purpose through the following objectives:

- To explore and describe the resilience of health caregivers and risk groups
- To implement and validate strategies developed by Koen, Van Eeden and Wissing (2010c) to strengthen resilience of professional nurses and other health caregivers and risk groups
- To explore and describe faith community nursing as intervention to strengthen the resilience of health caregivers and risk groups
- To explore and describe sensory stimulation as intervention to strengthen the resilience of health caregivers and risk groups

To achieve these objectives, it is necessary to explore and describe various health caregivers and risk groups. Within this overarching research project, Chantal Marais intend to focus on the well-being of operating room nurses in a Private Hospital in the North West Province. Nurses are viewed as risk groups in terms of their well-being, and, in line with the objectives of the overarching research project, there is a need to explore and describe their resilience, in order to formulate recommendations to strengthen their resilience and overall well-being. The results of this sub-study will contribute to reaching the objectives of the overarching project with more recommendations that can be implemented in other nursing departments where the well-being and resilience of nurses needs to be strengthened. We therefore confirm that the sub-study of Chantal Marais is covered by the above-mentioned ethical clearance.

Yours sincerely

Prof MP Koen	Dr E du Plessis
Co-investigator	Co-investigator



APPENDIX E



Sr. C Marais

14/06/2012

Re: Permission for completing of research project

We hereby give permission to complete your research study in Wilmed Park Hospital Operating Room and Intensive Care Unit.

We wish you well with this process and are looking forward to the benefits that this research will contribute to our organization.

Regards



HS STEENKAMP
HOSPITAL MANAGER



L NEL
NURSING SERVICES MANAGER

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KDM TRADING TRUST t/a WILMED PARK PRIVATE HOSPITAL

Trustees: MD van Tonder (Managing), M Freese (Chairman), AJ Gill, FB Pelsner, PC Piek, HS Steenkamp, JJ van Aswegen
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7 June 2012

To whom it may concern

WITH REGARDS TO: RESEARCH – THE EFFECTIVENESS OF SENSORY
STIMULATION THERAPY TO STRENGTHEN THE WELL-BEING OF
OPERATING ROOM NURSES

I, Marinda du Plessis, Hospital Manager at Sunningdale Hospital, hereby grant
permission to Chantal Marais to conduct her research study in our Hospitals
Operating Room.

Yours faithfully

Mrs. M. du Plessis
Hospital Manager



APPENDIX F



-----4----- **CONSENT FORM** -----

Title: The effectiveness of Sensory Stimulation Therapy on strengthening the well-being of operating room nurses

Researcher: C. Marais, Registered Nurse

I, Chantal Marais, a registered scrub nurse, am currently studying the effectiveness of Sensory Stimulation Therapy (SST) as an intervention to strengthen the well-being of operating room nurses in a Private Hospital in the North West Province. I herewith invite you to participate in my study.

The objectives of the study include the following:

- * To explore and describe OR nurses' needs for SST in a Private Hospital in the North West Province.
- * To explore and describe OR nurses suggestions regarding the implementation of SST in an OR environment in the North West Province.
- * To explore and describe the effectiveness of a SST intervention in strengthening the resilience of OR nurses in a Private Hospital in the North West Province.

Three groups of participants will take part in the study. Two comparison groups and one intervention group. All participants will attend information sessions regarding the purpose, objectives, data collection methods, the intervention and the ethical considerations of the above mentioned study.

Both the comparison groups and the intervention group will complete a Resilience Questionnaire before and after the intervention. Participants in the intervention group will also complete a self report questionnaire to gain their input into needs and suggestions regarding the implementation of the SST intervention.

Participation in this study will continue over a time period of two and a half consecutive months.

Participation in this study is voluntary and you can withdraw at any given point without any penalty.

Data will be collected by the researcher herself. All the data gathered will be coded and no names or identities will be reported or published without your permission.

The study has been approved by the necessary ethical committees at the North West University (Reference number: NWU-00036-11-S1).

For any questions you can contact Chantal Marais.

I was informed by the researcher and read the consent form regarding the above mentioned study. I voluntarily consent to participate in the study and understand that I can withdraw at any given time without any penalty.

Participants Signature

Date

I have informed the participant regarding the purpose, objectives, data collection methods, the intervention and the ethical considerations of the above mentioned study.

Researchers Signature

Date



APPENDIX G



“Die sensoriese stimulasie kamer was omtrent ’n stimulasie! Ek is op verbeeldingstogte geneem ver van hier, stres vlakke is ook verminder. Om daar te sit het mens in liggaam en gees vergeet wat werklik buite die deure aan die gang was. Dit is ’n totale ontvlugting. Dit was jammer dat die tyd om daar te gaan “ontvlug” soms te min was. Ek dink vir elke persoon was die kamer stimulerend en is dit voorwaar ’n aanwinst tot positiewe denke vir teater.”

“Dit was absoluut ’n wonderlike ervaring om net tussen gevalle of moeilike lyste, net vir tien minute in die kamer te sit. As jy die deur toegemaak het, het jy jouself net afgesluit van die werk en net ontspan. Ek dink dit is ’n fantastiese idee om ’n sensoriese stimulasie kamer te hê veral in teater waar baie stress en druk is en om net vir ’n rukkie te vergeet. Dit gee ’n mens die moed en lus om weer aan te gaan met jou daaglikse take. Ek het dit baie positief ervaar”.

“Sjoe! Na ’n vinnige, lang, moeilike lys kan ek nie wag om daar te gaan sit en ontspan nie. Dan vergeet jy van al die sukkel en stres. Jy kan tussen lyste daar gaan sit en net vir vyf minute gaan afsluit. En na vyf minute voel jy weer verfris en pak die volgende lys vol moed en spoed aan”.

“It is a wonderful thought that came into someone’s brain and clearly the thought came after clear evaluation of theatre personnel and the environment pressure. This room is inside theatre and accessible at any given time. Most of the time the theatre personnel find themselves in a situation where one needs to relax the mind to think better. As the pressure in theatre increases we all have unique ways of handling situation, some become angry, others agitated, depressed and they find it difficult to find a solution during that present time.

What I like about the room is that it is calming, relaxing and one can be able to think wiser. As one approaches the room, already the mind set changes because you know you are going to relax. Just by emerging the room there is such a sweet, pure aroma that is well-coming, music being one of relaxation therapy plays soft and nice. The external stimuli changes immediately, less noise, limited irritation and the impulse goes straight to the brain, instantly the brains begins to relax. Before one sits on the massage chair, muscles begin to relax relieving all the tension.

Colourful lights bring life and enthusiasm back. The eye senses peace and a reason to go back and share it with other personnel. The breathing pattern becomes slower and deeper as one lies on the massage chair. Emotions begins to change in a positive manner, one is

able to plan on how to handle the situation that made him/her to enter the room. Attitude changes and that bring forth a better atmosphere in the working area.

There is some tea and coffee that is perfect. The best part of the therapy is that there is no distraction and no disturbance”.



APPENDIX H



PICTURES : SST ROOM IN THE OR

