UNIVERSITY OF
KWAZULU-NATAL

INYUVESI
YAKWAZULU-NATALI

Integrating knowledge-to-practice for occupational therapists working with high-risk infants in the KwaZulu-Natal Public Health Sector: A Qualitative Explorative Inquiry

Ayesha Dawood

211511840

A thesis submitted to the College of Health Sciences, University of KwaZulu-Natal, in fulfilment of the requirements for the degree of ***Masters in Occupational Therapy***

December 2020

DECLARATION

I, **Miss Ayesha Dawood**, student number **211511840**, declare as follows:

(i) The research reported in this thesis, except where otherwise indicated, is my original research.

(ii) This dissertation has not been submitted for any degree or examination at any other tertiary institution.

(iii) This dissertation does not contain other person's data, pictures, graphs or other information, unless specifically acknowledged as being sourced from other persons.

(iv) This dissertation does not contain other persons writing, unless specifically acknowledged as being sourced from other researchers. Where other written sources have been quoted, then:

a) Their words have been paraphrased but the general information attributed to them has been referenced; and
b) Where their exact words have been used, their writing has been placed inside quotation marks, and referenced.

(v) This dissertation does not contain text, graphics or tables copied and pasted from the Internet, unless specifically acknowledged, and the source being detailed in the dissertation and in the References section.

(vi) Original information contained in this dissertation, should not be reproduced without prior written permission from the author.

(vii) The work was done under the guidance of supervisors from the University of KwaZulu-Natal Discipline of Occupational Therapy.

Ayesha Dawood **10 December 2020**

DEDICATION

This research is dedicated to all the hardworking Occupational Therapists in the public health sector who are passionate about early childhood intervention and supporting high-risk infants and their families.

You are an inspiration, and I hope that this work will help in benefiting our future practice.

ACKNOWLEDGEMENTS

I would like to acknowledge and express my appreciation and gratitude to the following individuals, who without their assistance, this research would not have been possible.

The occupational therapists of the KZN public health sector who dedicated their time to participate in this study. I am honoured to be your colleague.

My supervisors, A/Prof Pragashnie Naidoo, Dr. Michael O. Ogunlana and Mrs Gina Rencken for their guidance and encouragement in completion of this study.

My parents A.K. and Rabia Dawood for your continued motivation and support through this study.

My friends who constantly encouraged me and believed in me.

The University of KwaZulu-Natal for the bursary that was granted in fee remission to make the completion of this dissertation possible.

TABLE OF CONTENTS

DECLARATION ..... **ii**
DEDICATION ..... **iii**
ACKNOWLEDGEMENTS ..... **iv**
TABLE OF CONTENTS ..... **v**
LIST OF FIGURES ..... **viii**
LIST OF TABLES ..... **ix**
OPERATIONAL DEFINITIONS ..... **x**
ABBREVATIONS ..... **xi**
PREAMBLE ..... **xii**
ABSTRACT ..... **xiii**
CHAPTER 1: INTRODUCTION **1**
1.1 Background and Context 1
1.1 Problem statement 6
1.3 Rationale for the Study 9
1.4 Research questions, aims and objectives 10
1.4.1 Research Question *10*
1.4.2 Aim *11*
1.4.3 Objectives *11*
1.5 OVERVIEW OF THE LITERATURE 11
1.5.1 Introduction *11*
1.5.2 Knowledge Translation (KT) in Health Care *11*
1.5.3 Knowledge Translation in Rehabilitation *14*
1.5.4 Knowledge Translation in OT *16*
1.5.5 NICU and High Care Units globally *18*
1.5.6 NICU and High care units in South Africa *19*
1.5.7 Neurodevelopmental Supportive Care (NDSC) *19*
1.5.8 Best Practice Guidelines (BPG) for NDSC *20*
1.5.9 The Occupational Therapists role in neonatal care – A global perspective *21*
1.5.10 Occupational therapy role in neonatal care – A South African perspective *22*
1.5.11 Occupational Therapy undergraduate and post graduate training in NICU practice *24*
1.6 METHODOLOGY 25
1.6.1 Introduction *25*

1.6.2 Research Design ... 25
1.6.3 Conceptual Framework ... 26
1.6.4 Formulation of Qualitative Questions ... 28
1.6.5 Study Setting ... 29
1.6.6 Selection of Participants ... 30
1.6.7 Data Collection Instrument ... 33
Data Collection Procedure in the period of the South African "lockdown" due to the COVID19 pandemic 33
1.6.8 Pilot Study ... 35
1.6.9 Questionnaire for Demographic Information ... 35
1.6.10 Data Safety and Monitoring Plan ... 36
1.6.11 Data Analysis ... 36
1.6.12 Data Quality ... 39
1.6.13 Ethical Considerations ... 41
1.6.14 Conclusion ... 44
CHAPTER 2: MANUSCRIPT ... 45
INTRODUCTION ... 47
STUDY DESIGN ... 48
Theoretical framework ... 48
Methodological orientation and theory ... 48
PARTICIPANT SELECTION ... 50
Sampling 50
Method of approach ... 50
Sample size 51
Non- participation ... 51
SETTING ... 51
Setting of data collection ... 51
DATA COLLECTION ... 52
ANALYSIS AND FINDINGS ... 53
Data Analysis ... 53
Ethical Considerations ... 54
REPORTING ... 54
Results 54
THEME 1: OT and neonatal care in the public health sector ... 55
THEME 2: Knowledge Acquisition and Knowledge Synthesis ... 57

THEME 3: Knowledge Translation/Utilization ... *60*
THEME 4: Contextual barriers and adaptation ... *61*
THEME 5: The ideal OT and neonatal setting ... *62*
Discussion ... 64
Methodological considerations and limitations ... *66*
CONCLUSION ... 66
REFERENCES ... 67
CHAPTER 3: SYNTHESIS ... 71
3.1 INTRODUCTION ... 71
3.2 KEY FINDINGS AND IMPLICATIONS ... 72
3.3 RECOMMENDATIONS ... 81
3.3.1 Policy and Protocol ... 81
3.3.2 Policy and Protocol specific to COVID19 ... 81
3.3.3 OT Post-graduate Training Recommendations ... 82
3.3.4 OT Undergraduate Training ... 82
3.3.5 OT Role Recognition ... 83
3.3.6 Recommendations for Future Studies ... 83
3.4 LIMITATIONS ... 84
3.5 CONCLUSION ... 84
REFERENCES ... 86
APPENDIX A: Online Focus Group Schedule ... 110
APPENDIX B: Invitation to Participate in Research ... 112
APPENDIX C: Information Sheet & Consent ... 113
APPENDIX E: Proforma for Demographic Information ... 118
APPENDIX F: Demographics of Participants ... 119
APPENDIX G: Common Themes and Ideas ... 121
APPENDIX H: Codes and Sub-Codes and Themes ... 125
APPENDIX I: Themes influenced by Objectives ... 126
APPENDIX J: Results ... 127
APPENDIX K: Reflection ... 147
APPENDIX L: Ethics Approval 1 ... 148
APPENDIX M: Ethics Approval 2 ... 150

LIST OF FIGURES

Figure 1 Miller's Pyramid (Miller, 1990)..... 5
Figure 2 Conceptual framework of the study 27
Figure 3 Formulation of the qualitative questions (Discovery - knowledge enquiry, knowledge synthesis and.....28
Figure 4 Formulation of the qualitative questions (Dream of the ideal and sustaining knowledge in neonatal.....29
Figure 5 Map of the districts in the province of KZN, including an outline of districts that were represented in.....29
Figure 6 Levels of health care institutions in the province of KZN. Levels of care included in this study are 30
Figure 7 Open-ended questions in focus group.....53

LIST OF TABLES

Table 1: Participant demographic information (n=17) 36
Table 2: Demographic profile of occupational therapists (n=17).....51
Table 3: Sample and Data Collection Method.....52
Table 4: Summary of Themes and Subthemes 55

OPERATIONAL DEFINITIONS

Community Service: Mandatory year of working in the public health sector following completion of the undergraduate training programme in SA (HPCSA, 2011).

Evidence Based Practice: It is the integration of the best research evidence, clinical expertise and patient needs that will result in the best patient outcomes (Melnyk, Fineout-Overholt, Stillwell, & Williamson, 2010).

Appreciative Inquiry Approach: It is a process that explores, recognises, and creates improved processes in organisations by identifying their strengths for long term change and an improved future (Coghlan, Preskill, & Tzavaras Catsambas, 2003).

High-Risk Infant: It is an infant that requires more than the standard monitoring, tests, interventions, and care offered to a healthy term new-born infant. This can include infants born pre- or post-term, those with inappropriate growth for gestational age, those who manifest signs and symptoms of systemic illnesses, metabolic abnormalities, or congenital malformations requiring early evaluation and treatment are known as “high-risk infants” (Lissauer & Carroll, 2017).

Knowledge Translation: A dynamic and iterative process that includes the synthesis, dissemination, exchange and ethically sound application of knowledge to improve health, provide more effective health services and products, and strengthen the health care system (Straus, Tetroe, & Graham, 2009).

Neonatal Intensive Care Unit: Highly specialised environment that caters for the needs of extremely ill or at-risk infants providing life support and comprehensive care (Hunter, Lee, & Altimier, 2015).

Neonate: A new-born infant, not more than twenty-eight days old (WHO, 2020).

Occupational Therapy: Occupational therapy (OT) is a health profession concerned with enhancing health and well-being through occupation. The primary aim of OT is to empower people to participate in their activities of daily living as the focus is very client centred. OTs work with people and communities to develop their ability to engage in meaningful occupations or help by altering the task or environment to provide more support to assist successful engagement (HPCSA, 2011).

ABBREVATIONS

AI	Appreciative Inquiry
BPG	Best Practice Guidelines
CP	Cerebral Palsy
DOH	Department of Health
EBP	Evidence Based Practice
ECI	Early Childhood Intervention
HIE	Hypoxic Ischemic Encephalopathy
HPCSA	Health Professions Council of South Africa
IKT	Integrated Knowledge Translation
KT	Knowledge Translation
KTA	Knowledge to Action
KZN	KwaZulu-Natal
LMIC	Low Medium Income Country
LTHC	Long Term Health Condition
MDG	Millennium Development Goal
MDT	Multidisciplinary Team
NDSC	Neurodevelopmental Supportive Care
NICU	Neonatal Intensive Care Unit
OT	Occupational Therapy
OTASA	Occupational Therapy Association of South Africa
SDG	Sustainable Development Goal
SOP	Standard Operating Procedure
WFOT	World Federation of Occupational Therapy
WHO	World Health Organisation

PREAMBLE

This thesis is formatted as a Masters via Manuscript, which is in keeping with guidelines for submission within the College of Health Sciences at the University of KwaZulu Natal, Westville Campus, South Africa. It is comprised of an introductory section (Chapter 1), one manuscript formatted for a selected journal (Chapter 2) and a synthesis section (Chapter 3), as opposed to a traditional monograph format. The introductory chapter (chapter 1) outlines the background and purpose of the study as well as an overview of the relevant literature and methodology. Chapter 2 reports the findings of the study in an original research manuscript for submission to the Scandinavian Journal of Occupational Therapy. The synthesis (Chapter 3) outlines the conclusions formed and includes recommendations for the way forward.

The candidate essentially followed the same process in terms of planning, conducting and preparing the research for examination with the same key milestones as for a traditional thesis. A proportion of the literature and methodology from the introductory chapter may appear in the manuscripts. This may lead to some repetition between the integrative material and the manuscripts, which is necessitated by virtue of the manuscript format.

ABSTRACT

Introduction: *Neonates are an at-risk population due to their increased susceptibility of mortality and morbidity. Occupational therapists have an important role in Early Childhood Intervention (ECI) and implementing Neurodevelopmental Supportive Care (NDSC) for high-risk infants whilst they are admitted in the Neonatal Intensive Care Unit (NICU). To the best knowledge of the author there is a paucity of literature available within the South African context in the use of evidence-based practices (EBP), and the integration of knowledge translation (KT) amongst occupational therapists who provide therapeutic management to high-risk infants and their families.* ***Aim:*** *This study aims to explore the knowledge to practice gaps experienced by occupational therapists who support high-risk infants in different levels of care in the public health sector of KwaZulu-Natal South Africa.* ***Methods:*** *A qualitative exploratory research design was used for this study. A nonprobability sampling technique was used. Seventeen occupational therapists who have more than two years of experience and are employed on a full-time basis in the public health sector of KZN participated in this study via online focus group discussions. Data were analysed using thematic analysis with inductive deductive reasoning, guided by a combined theoretical framework using the Appreciative Inquiry (AI) approach and KT process as a methodological orientation to the study.* ***Research Ethics:*** *Principles of confidentiality, autonomy, informed consent, beneficence, non-maleficence, and justice were adhered to. Participants were not of a vulnerable population and therefore support was not offered upon completion of the research discussions.* ***Results:*** *Five themes emerged in this study, namely, occupational therapy (OT) and neonatal care in the public health sector, Knowledge Acquisition and Knowledge Synthesis, Knowledge Translation/Utilization, Contextual barriers/adaptation, and the ideal OT in the ideal neonatal setting. Therapists outlined the facilitators, inhibitors, referral pathways and their personal interests in OT neonatal care. Supportive management and multidisciplinary teams (MDT) were highlighted as facilitators in the hospital environment whilst OT staff shortages, insufficient undergraduate training in the field and a lack of funding for courses for postgraduate OT training were regarded as inhibitors to practice. OTs source and synthesise knowledge from multiple sources to integrate, utilise and translate into neonatal practice. Contextual barriers are identified in various levelled facilities with acquired neonatal knowledge being adapted by therapists for low resourced settings. Participants envision the dream of the ideal day and therapist to intervene with neonates in the public health sector of KZN.* ***Conclusion:*** *Findings have identified several knowledge-to-practice gaps for OTs who support neonates in low resourced settings. Therapeutic resources and funding for postgraduate training, an improvement in the undergraduate curriculum, and policy development appear to be necessary to inform a standard of care across the province.*

Keywords: Occupational therapy, knowledge translation, evidence-based practice, high-risk infant, neonates

CHAPTER 1: INTRODUCTION

1.1 BACKGROUND AND CONTEXT

Globally it is known that an increased rate of mortality in children under the age of five years old, arises during the neonatal period (UNICEF, 2018). Neonatal mortality rates are influenced by preterm births, hypoxic-ischaemic encephalopathy (HIE), various neonatal infections, neonatal jaundice and complex congenital diseases. (Blencowe et al., 2016; Lawn, Cousens, Zupan, & Team, 2005; Lawn, Kerber, Enweronu-Laryea, & Cousens, 2010; Oestergaard et al., 2011). In 2018, global neonatal mortality rates decreased to 18 deaths per 1000 live births (Hug, Sharrow, & You, 2019). Global neonatal mortality rates in the year 1990 were 37, and 31 in the year 2000 per 1000 live births, respectively. This shows a 42-52% decline in the past 28 years (Hug et al., 2019). This significant decline is attributed to better antenatal care, skilled obstetric health care workers, effective post-natal care for mother and infant as well as quality health care services offered for infectious diseases, low birth weight and sick infants. However, neonatal mortality rates still remain high despite improvement in global efforts (Hug et al., 2019; Shung-King, Lake, Sanders, & Hendricks, 2019). Good health and wellbeing as part of the third Sustainable Developmental Goals (SDG) aim to reduce neonatal mortality to at least 1.2% per 1000 live births by the year 2030 (Griggs et al., 2013; UNICEF, 2019; E. W. E. C. WHO, 2015). Currently, neonatal mortality rates per 1000 live births stand at 28% in Sub Saharan Africa, 16% in Northern Africa, 25% in Central and Southern Asia and 3% in Europe and Northern America (Hug et al., 2019).

In South Africa, an estimated 12% of neonates die per 1000 live births annually during the perinatal and first weeks of life (Richter et al., 2019). A further 23% of infants (over the age of 28 days) die per 1000 live births annually in South Africa (Nannan et al., 2019). Neonatal mortality as a result of prematurity (49.2%), birth asphyxia (28%), congenital abnormalities (9%) and neonatal infections (8.1%) was the major contribution to under-five mortality rates in South Africa, keeping in line with global causes of neonatal deaths (Rhoda, Velaphi, Gebhardt, Kauchali, & Barron, 2018; Shung-King et al., 2019). Although infant mortality rates have decreased significantly over the past five years, they still remain high for a middle-income country like South Africa (Shung-King et al., 2019). The burden of neonatal and infant mortality and morbidity in low to medium income (LMIC) countries is influenced by an unhealthy and unsafe environment due to high levels of poverty and inequality. Inadequate nutrition, insufficient protection from violent crimes, an inability to access clean water, sanitation, early childhood development centres, education, and frequently needed health care services, contribute significantly to the burden of child mortality and morbidity in the South African context.

However, South Africa has made good advancement since the initiation of the Millennium Development Goals (MDG) in the year 2000. For 15 years the MDG's drove change in decreasing levels of income inequalities and poverty, empowering women, improving access to water and sanitation in vulnerable communities, lessening child mortality and morbidity, fighting HIV/AIDS, and focusing on the improvement of maternal wellbeing by more than 50%. The MDGs influenced change in promoting early childhood intervention centres, free education for all quintile 1-3 primary schools, as well as compelling interest and buy-in from various government sectors to invest in forthcoming generations (United Nations, 2020). The gains achieved by the MDG's were not entirely successful in reaching those who needed it the most. This resulted in disparities amongst many countries worldwide, especially developing countries. The SDG's built on the groundwork of the MDG's in the year 2012, to focus on global political, economic, and environmental difficulties, with the main emphasis being on future sustainability.

The SDG's are still a work in progress globally, as well as in South Africa in which insufficient consideration has been given to the prevention of infectious diseases that affect the health of our children, and the failure to determine the social aspects of child health in general. These factors are further impacted by high levels of poverty, unemployment and low accountability on the Constitutional Directive of Child Health and Welfare, implemented by the National Department of Health (Shung-King et al., 2019). Children from Sub Saharan Africa and other low-income countries are still the worst affected in terms of meeting the SDG's, regardless of South Africa achieving positive economic accomplishments as compared to any other country in Africa (UNICEF, 2019). South Africa additionally displays inequality in child health care between the more rural provinces (KwaZulu-Natal, Free State, Mpumalanga and Eastern Cape) as compared to urban provinces such as Gauteng and the Western Cape (Shung-King et al., 2019).

Whereas child mortality rates have proven to have shown a significant decline over the past 20 years, there is a need to emphasise child morbidity. The results of preterm birth complications and other neonatal risk factors at birth may lead to a neurological injury that can result in long term cognitive, sensory, and motor impairments in infants (Aylward, 2014a; McCormick, Litt, Smith, & Zupancic, 2011; Mwaniki, Atieno, Lawn, & Newton, 2012). Cerebral palsy (CP) is one of the highest cases of morbidity related conditions occurring in 2.5% of 1000 live births globally (Braun et al., 2016; Sellier et al., 2016; Shevell, Dagenais, & Oskoui, 2013; Smithers-Sheedy et al., 2016). CP as a result of postnatal complications is more prevalent on the African continent and in South Africa particularly. This can be attributed to inadequate antenatal care, children being born before arrival at health facilities, severe acute malnutrition and other diseases (CDC, 2019). CP is associated with multiple comorbidities per a 1000 live births, such as seizures (46.7%), impairments in language (43.5%), impairments in vision (25%), as well as cognitive impairments (24%) (Novak et al., 2013; Shevell et

al., 2013). Other comorbidities as a result of preterm births and other neonatal complications result in learning disabilities (29.7%), developmental delays, sensory processing disorders (20.9%), behavioural problems (13.1%), and various psychiatric disorders (autism, emotional disorders, and attention deficit hyperactivity disorder) (Bhutta, Cleves, Casey, Cradock, & Anand, 2002; Burnett et al., 2011; Johnson & Marlow, 2011; Lecuona, Raubenheimer, van Heerden, & van Jaarsveld, 2016; Mwaniki et al., 2012).

There is a shortage of data available on the rates of morbidity, and the results of impairment or disability following neurological insults post preterm and full-term births in low to medium income countries as compared to high-income countries, although 98% of neonatal morbidity occurs in underprivileged countries. Therefore, this is indicative of the lack of emphasis that is placed on research in the retrieval of data concerning disability in these countries (Lawn et al., 2010; Mwaniki et al., 2012). Due to morbidity and its effect on occupational participation being a part of the Occupational Therapy (OT) scope of practice, it becomes imperative that early recognition of neurodevelopmental disorders and the care of the developing brain through neurodevelopmental supportive care (NDSC) is implemented in hospital neonatal intensive care units (NICU) and high care units so that the severity of morbidity may be reduced (Department of Health, 1974; Griffiths, Spence, Loughran-Fowlds, & Westrup, 2019; Roley et al., 2008). This will promote optimum growth, development and future educational opportunities for infants that are at risk. In general, there is a need for multidisciplinary team (MDT) intervention approaches to patient care. However, across the African continent and in South Africa, especially in the province of KwaZulu-Natal (KZN) there is a shortage of health care workers and rehabilitation therapists across all fields (Donald, Samia, Kakooza-Mwesige, & Bearden, 2014; Ennion & Rhoda, 2016; Sherry, 2014). The lack of standardised cultural and language appropriate assessment tools in clinical practice and the lack of facilities that are specific to rehabilitation have been noted to be limited (Novak et al., 2013; Sherry, 2014; Shevell et al., 2013).

NICU's admit high-risk infants as a result of premature births, or other medical comorbidities. Neonates are a highly vulnerable population and are very reliant on the parent and the continuous, timeous care received from the MDT. NDSC is crucial, and it needs to be personalised to the neonate's unique requirements and specific problems (Macho & Zukowsky, 2017). NDSC practices are being researched continuously and implemented across high to medium-income countries globally (Austin, Downing, & Hastings-Tolsma, 2019). However, NDSC has not been widely studied or carried out within the South African context (Kenner & McGrath, 2004; Lubbe, 2010), especially within the public health sector where the majority of births emerge (The Council for Medical Schemes, 2015). Prematurity affects 1 in 9 live births (500 000 neonates per a year) in the United States, and between 12.5-20/1000 live births in South Africa, making it one of the major concerns in the public health sector (Brink, Gebhardt, Mason, Groenewald, & Odendaal, 2019; Lloyd & De Witt, 2013; March

of Dimes, 2013). NDSC lays a foundation for optimal developmental outcomes as the neonate is appropriately nurtured (Lubbe, 2010). Thus, the MDT involved in the care of the neonate has a vital role in implementing and tailoring NSDC guidelines to each family and infant (Browne, 2011).

Presently, many NICU's in LMIC's, such as South Africa do not have a supportive extra uterine environment that encourages normal neurodevelopment (Lubbe, 2010; Rakhetla, 2015). Whilst evidently it is known that first world countries like the United States and the United Kingdom have specialised NICU's promoting NDSC and specific practice guidelines for neonatal occupational therapists (Royal College of Occupational Therapists, 2017; Vergara, Anzalone, Bigsby, & Gorga, 2006). The NICU is the safest environment for a premature or high-risk infant to be in post-birth due to the advanced technological equipment that assists in maintaining physiological homeostasis. However, it may also be unfavourable as it may pose as a risk to the developing brain (Erdeve, Atasay, Arsan, & Türmen, 2008; Rakhetla, 2015; Vergara et al., 2006). An unsupportive environment puts the neonate at risk of irreversible neurological impairments as it becomes difficult to control disturbed sleep and wake states, emotional and behavioural regulation, high levels of noise, poor positioning, increased handling of the infants, and decreased opportunities for infant and parent bonding (Kardaş Özdemir & Güdücü Tüfekci, 2014; Lubbe, 2010; VandenBerg, 2007). NDSC assists the MDT in understanding the physiological and physical behavioural indicators of the new born infant in relation to the stressful NICU and high care environment (Browne, 2011; Vergara et al., 2006). NDSC is an approach that should be practised by all staff in the NICU, to influence the demanding NICU/high care setting to promote the effects of the intrauterine environment as closely as possible; ultimately this assists in promoting the overall development of the neonate (Lubbe, 2010; Nightlinger, 2011).

OT in the NICU/high care is a highly specialised and risky field of practice. Every neonate, their family and the unit in which they are admitted are different. Therefore the occupational therapist will need to have specific training, knowledge and skills to understand sensitive and complex medical diagnoses and the effect that it may have on the developing brain, this will ensure that interventions are safe and as effective as possible (Browne, 2011; D. Gorga et al., 1993; Nightlinger, 2011; Vergara et al., 2006). A barrier that the South African public health sector is facing is that the MDT is struggling in grasping the importance of practising NDSC strategies within the NICU/high care setting (Lubbe, 2010). A study by Rakhetla (2015), has recognised that several areas in numerous NICU's in South Africa did not follow the guidelines of NDSC, as they lacked providing a simulation of the intrauterine setting as well as encouraging self-regulation of the infants. The transferring of knowledge in identifying behavioural cues in the premature infant was not shared amongst the MDT; interventions were governed by the biomedical model instead of prioritising the neurodevelopmental requirements of each neonate. Controlled and safe visitation from siblings and grandparents, communication channels with parents

and staff was inadequate, general staff shortages and aspects such as the provision of positioning materials and equipment was not always available (Butler, 2018; Lubbe, 2010). Thus, it is imperative that evidence-based practice in the NICU and high care units are implemented by the MDT, with a specific focus on the role of the occupational therapist as their vast knowledge in child development, and ideologies of holistic intervention strategies builds a basis for an exclusive and valued influence on the neonate in under-resourced environments within the public health sector of KZN.

Rehabilitation therapists are expected to use clinical reasoning with careful, thoughtful and clear use of studying evidence-based practices (EBP) so that they can make knowledgeable choices that influence the treatment of their client's (Menon, Korner-Bitensky, Kastner, McKibbon, & Straus, 2009) However, it has been acknowledged that there is a dearth in research evidence versus practical application in clinical practices (Davis et al., 2003). Being able to recognise this gap has encouraged great interest in knowledge translation (KT) among researchers and clinicians, as KT allows for the giving, taking, and integration of concrete and practical applications within multifaceted organisations; therefore to bridge the gap between knowledge and practice it is integral that clinicians must be able to recognize which interventions are relevant in driving knowledge attainment in all clinical areas (Menon et al., 2009). As suggested by Miller's pyramid, procuring knowledge is crucial as it builds a solid underpinning for encouraging transformation in the views, attitudes and practical skills of clinicians in treatment and goal setting (Miller, 1990).

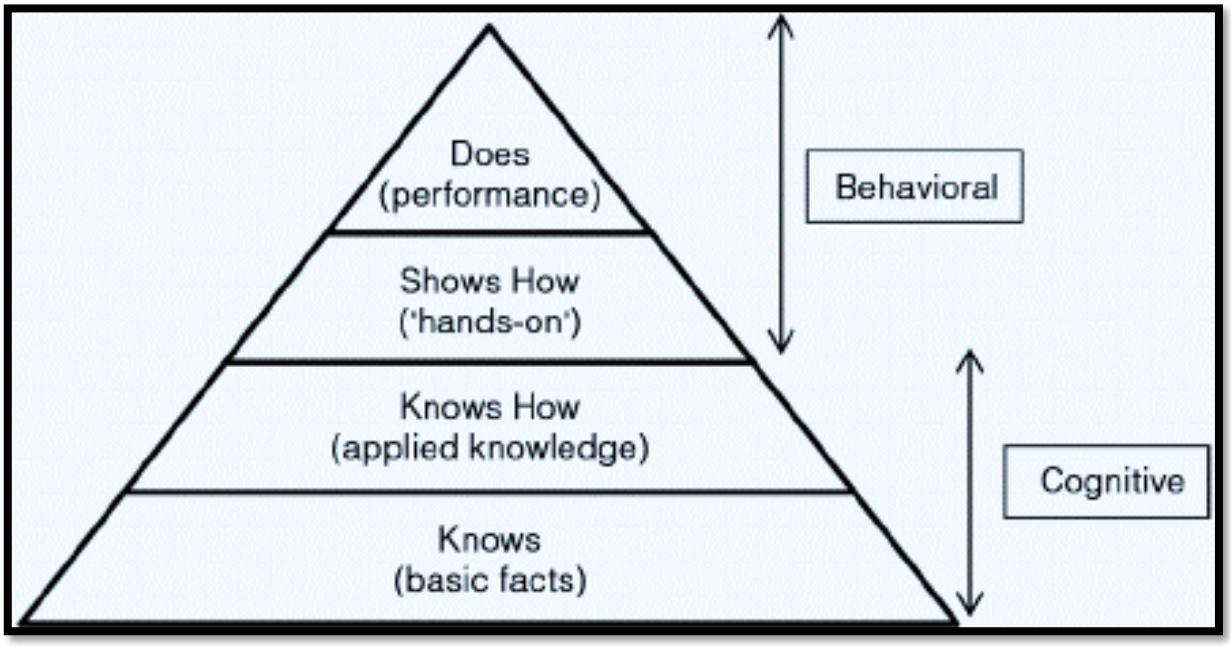


Figure 1 Miller's Pyramid (Miller, 1990)

This exploratory study thus seeks to explore, discover, and envision knowledge support for occupational therapists who work with neonates in the public health sector of KZN. This study may provide a baseline of valuable content and ideas, to encourage the development and implementation of EBP for occupational therapists who work within the NICU, high care units, kangaroo mother care units as well as, influence the general care of the high-risk infant**.**

1.1 PROBLEM STATEMENT

South African child morbidity statistics are high. It is known that one in five children (4.5 million) born in South Africa will have a long-term health condition (LTHC). The occurrence of congenital anomalies was a projected 6.8% (83 000) of all live births in the year 2012 (Woods, Aldous, Christianson, & Malherbe, 2016). It is estimated that 1.15 million of South African children are diagnosed with developmental, cognitive, sensory, and movement difficulties, with a significant amount being congenital (Olusanya et al., 2018; Statistics South Africa, 2014). There is insufficient morbidity statistics available in South Africa for infants and children up to the age of five years old, with available statistics focusing only on infant and child mortality rates. In the province of KZN there is a lack of statistics relating to morbidity in early childhood, with data focusing on disability prevalence as a whole within all age groups in the province (Maluleke, 2016). South Africa has a large number of children with LTHC's, whose rights to survive, developing to their full potential and having access to basic health care is not being met by government and the communities in which they reside (Shung-King et al., 2019). OT in the NICU and high care units, therefore, needs to be strengthened in the management of the high-risk infant and the family, to decrease the severity of morbidity through early intervention and NDSC.

It is known that the Department of Health (DOH) in the province of KZN is continually facing challenges due to the great need for maternal and child health services from increased fertility rates, extreme poverty, malnutrition and other psychosocial factors (Department of Health, 2017; Province of KwaZulu-Natal, 2016; Shung-King et al., 2019). It is estimated that 30% of infants will die early from complicated neonatal conditions; the remainder of this population will likely need a lifetime of MDT intervention which includes OT. Early childhood intervention (ECI) in the first thousand days of life is a period of high importance as the fundamentals of growth, ideal neurodevelopment, and good health outcomes are created (Cusick & Georgieff, 2016). Scientifically it has been proven that the period between conception and a child's second birthday is crucial, and due to the increased risk of negative factors that may be experienced in low resourced environments, it may result in irreversible damage to the still-developing brain. The early identification and detection of neurodevelopmental complications in high-risk infants are critical, as it allows for timeous medical interventions to be implemented so that there are improved developmental outcomes (Cioni & Sgandurra, 2013). Health care professionals that provide early intervention are encouraged to have specialised training and

knowledge in the field, as this will allow for optimal treatment and effective implementation of treatment programmes (HPCSA, 2000). Currently, it is known that occupational therapists in the province of KZN, South Africa do not feel that they possess the skills and handling to work in highly challenging NICU's and other units that admit at-risk infants due to incomprehensive undergraduate training, and private neonatal courses being unaffordable (Hardy, Govender, & Naidoo, 2020).

A further gap that has been identified is that there is a lack of EBP norms, guidelines, policies or standard operating procedures in the management of the high-risk infant in the OT scope of practice within the public health sector of KZN. It is known that many therapists have developed their own intervention guidelines for their specific contexts from various sources such as colleagues, the internet and textbooks (Hardy et al., 2020). Globally and in the South African context, research within nursing care practice and NDSC has been explored. Best Practice Guidelines (BPG) was developed by Lubbe (2010), for use in South African NICU's for all health practitioners. The Limpopo Initiative for Newborn Care (LINC) is a partnership between the University of Limpopo and the Limpopo DOH to improve new-born care and services by providing resources, training, and mentoring to health workers in district health facilities in the Eastern Cape, Limpopo and the Free State provinces. The initiative aims to support health care facilities to improve their services to aid the optimal growth and development of infants (LINC, 2012). However, there are limited initiatives and literature available in South Africa with a focus specifically on the occupational therapist's role with high-risk infants, as well as there being a lack of comprehensive guidelines to support the therapist with intervention in the NICU.

A moratorium on therapeutic rehabilitation posts since 2016 in the province of KZN has placed a further burden on occupational therapist's roles in the institutions in which they are employed. Not many facilities have full-time occupational therapists to supervise the work of junior staff, and therapists must prioritise their patient load with administrative duties and work in other clinical areas. Most occupational therapy services offered in health care facilities in KZN are by newly qualified therapists or OT community service officers (CSO). A study by Hardy et al. 2019, reports that CSO's associated their initial work in the NICU as a negative experience due to the overwhelming environment. In South Africa, there are no speciality areas in the field of OT that are recognised by the Health Professionals Council of South Africa (HPCSA). In developed countries, occupational therapists require specialised training to work in the NICU (Altimier, Hunter, & Lee, 2015; Vergara et al., 2006). Therapists that do not enjoy working with paediatrics and CSO's who do not have the practical experience and limited academic knowledge in working with neonates are required to service specialised clinical areas such as the NICU due to the severe staff shortages. It, therefore, becomes imperative that there is an understanding in the way that knowledge is shared and utilised amongst full time and junior therapists to ensure a standard of care in the management of the high-risk infant across the province.

In the last ten years, there has been an overflow of evidence relating to KT, with an agreement amongst stakeholders that it is imperative that knowledge be translated into action. In a scoping review conducted by Gagliardi et al., 2015, it was discovered that there had been limited studies indicating the benefits and results of KT strategies, as well as decreased practical research on how to integrate KT (Gagliardi & Dobrow, 2016). Implementation research was used to investigate the current practices of NDSC amongst the MDT who service the NICU in two public hospitals in the province of Gauteng South Africa (Jacobs, Cateleijn, & Lubbe, 2018). A study in the province of KZN South Africa, investigated the experiences of community service occupational therapists working in the NICU (Hardy et al., 2020). A gap has been identified within the South African context in recognizing how full-time occupational therapists working in the NICU/High care units integrate their clinical experiences with EBP in the care of the neonate.

It is known that there is also a lack of research utilisation of EBP by occupational therapists who work in the NICU in the South African public health sector, with many therapists utilising various sources that may not be evidence-based or are currently outdated, which may pose to be harmful to the neurodevelopment of the high-risk infant (Hardy et al., 2020). Barriers that have been identified between the OT scope of practice and EBP have been attributed to unsupportive administration in the workplace (Humphris, Littlejohns, Victor, O'halloran, & Peacock, 2000), not having enough time to research EBP to integrate these findings into clinical practice (Bennett et al., 2003; Dysart & Tomlin, 2002; Korner-Bitensky et al., 2006), and the lack of self-confidence, knowledge and skills by therapists in their ability to synthesise findings of EBP and apply it to the clinical setting (Bennett et al., 2003; Dubouloz, Egan, Vallerand, & von Zweck, 1999; Welch & Dawson, 2006).

It is also known that there are no available EBP guidelines from the KZN Department of Health to support occupational therapists in the care of the neonate, which leaves therapists to find information to support their practice from sources that may not be evidence-based. There is a lack of collaboration and support between clinical occupational therapists, academics, and researchers within the NICU setting in the public health sector. If research and support within clinical settings were to be improved, it might promote the use of EBP in the care of the neonate. The exploration and use of KT in developing and determining the skills of occupational therapists in utilising EBP have been identified in previous studies in developed countries (Thomas & Law, 2013). However, it has not been explored with occupational therapists who support high-risk infants in the public health sector of KZN.

Therefore, it becomes of utmost importance to investigate and understand what the current knowledge levels, strengths and abilities of occupational therapists are, how is knowledge shared amongst therapists and what drives the intrinsic motivating factors that allow them to perform to the

best of their abilities in caring for the infant at risk. This study will focus on exploring the utilisation of KT and EBP in the care of the neonate, as well as exploring knowledge enquiry, and the synthesis of the knowledge and skills that are attained amongst full-time occupational therapists who care for high-risk infants in the public health sector of KZN.

1.3 RATIONALE FOR THE STUDY

Research has indicated that there is a limited understanding of the NDSC approach for high-risk infants (Lubbe, 2010; Rakhetla, 2015). Sensory development during the perinatal period is a susceptible phase that occurs in a particular order; with each system maturing in its course (Graven, 2000). Implementation of NDSC in NICU's and high care settings during this period will have lasting consequences on a neonate's perceptual and behavioural development. In LMIC countries such as South Africa traumatic and premature births are the main reasons for an increase in neonatal mortality and morbidity rates (Beck et al., 2010; Hoque, Haaq, & Islam, 2011; Lubbe, 2010). Goal 3 of the SDG developed by the World Health Organisation (WHO) aims to decrease neonatal mortality rates by 1.2% in 1000 births, as well as to reduce mortality in children below the age of five years before and until the year 2030 (UNICEF, 2018). The National Department of Health has prioritised and aligned itself with the SDG, in aiming to decrease maternal and child mortality rates (Department of Health, 2017). A study in the province of Gauteng South Africa discovered that one of the reasons as to why neonatal mortality rates were high is attributed to a poorly skilled MDT (Lloyd & De Witt, 2013). Other studies have deduced that the clinical outcomes of implementing NDSC during an infant's stay in the NICU results in reduced morbidity in the initial four weeks of being admitted, a decreased amount of time in the NICU, and significant improvement in neurobehavioral functioning when discharged which ultimately leads to reducing the financial costs of the health facility (Lubbe, Van der Walt, & Klopper, 2012). Previous studies have indicated that health workers need to be trained and knowledgeable in the care of the high-risk infant and their families to reduce morbidity and mortality outcomes (Knippenberg et al., 2005). Advancements in medicine have developed significantly over the last decade improving the medical outcomes of the neonate; therefore there needs to be a shift in focus from prioritizing survival also to include reducing consequences of morbidity to ensure an enhanced quality of life (Hinchliffe et al., 2013; Noble, 2003). Presently there is a dearth in the South African literature investigating opinions of the quality of care and the interventions that are sourced and utilised by the MDT with high-risk infants in the NICU (Butler, 2018).

The WHO has also promoted the Nurturing Care Framework for Early Childhood Development, by endorsing a complete package of care with regards to child health, providing training and education to parents and caregivers, adequate food security, opportunities for education and ensuring the safety of children (Black et al., 2017; Shung-King et al., 2019; UNICEF, 2018). Since the MDT consists of

various professionals with their skills and knowledge in their field, they become an asset in being able to implement the Nurturing Care Framework effectively. It was suggested by the Paediatric Neonatal Work Group of South Africa in an address to the Department of Health that NDSC should be prioritised in the NICU so that the developmental outcomes of the neonate is enhanced (Lubbe et al., 2012). The sharing of skills and knowledge amongst therapists who are skilled in the field as well as with other members of the MDT ensures that the implementation of NDSC is optimised (Lubbe et al., 2012).

Currently, in the public health sector of KZN the amount of full time employed occupational therapists has decreased to 45%, with many institutions being managed by junior occupational therapists (KZN OT Forum, 2019a). For new therapists, the NICU/High care, is an intimidating environment to be working in without the supervision of a superior (Case-Smith, Allen, & Pratt, 1996; Hardy et al., 2020). The occupational therapist working in the NICU is required to have expert training in NDSC to be able to plan inclusive intervention, evaluation and discharge planning of the neonate, providing education to staff and families, as well as making fast, efficient and effective decisions (Hockenberry & Wilson, 2018; Nightlinger, 2011; Royal College of Occupational Therapists, 2017). There is a scarcity of research available on the role and scope of occupational therapists within the NICU/high care in the South African context. A recent study by Hardy et al. 2019, discovered that occupational therapists found it challenging to establish their roles within the NICU; therapists also felt that they did not have the adequate skills and knowledge to work in the stressful NICU environment. The hardships experienced in the public health sector, especially with the high infant and child mortality and morbidity rates is an indication of the need to translate evidence-based knowledge into practice (Hoque et al., 2011; Sherry, 2014). Therefore, it is essential that current clinical standards of care are determined before EBP can be applied (Robinson, 2000). This study is aimed at discovering the existing knowledge to practice gaps and visualizing the ideal knowledge to practice interventions for occupational therapists who support high-risk infants in the public health sector of KZN.

1.4 RESEARCH QUESTIONS, AIMS AND OBJECTIVES

1.4.1 Research Question

- What is the knowledge to practice gaps of occupational therapists who work with neonates in the public health sector of KZN?
- What do occupational therapists visualise as the ideal knowledge to practice interventions to be implemented within the public health sector of KZN?

1.4.2 Aim

This study aims to explore the knowledge to practice gaps and the ideal knowledge to practice interventions of occupational therapist's working in neonatal care in the public health sector of KZN.

1.4.3 Objectives

- To explore what factors, motivate occupational therapists to work with neonates
- To explore how occupational therapists source information and knowledge to support the therapeutic management of the neonate.
- To explore how occupational therapists, synthesise and sustain knowledge to translate it into practice with neonates.
- To explore how occupational therapists overcome barriers, and what enables them to adapt their intervention strategies to their specific contextual needs.
- To explore the desires and dreams of the ideal occupational therapist who provides neonatal intervention.

1.5 OVERVIEW OF THE LITERATURE

1.5.1 Introduction

Preterm infants and neonates that are considered high risk due to birth traumas and other medical comorbidities are admitted in NICU's and high care units for further management. These units have innovative medical equipment, a team of specialists and other members of the MDT, to ensure the best possible care of the infant (VandenBerg, 2007). However, cases of morbidity and poor neurodevelopmental outcomes remain high; this may be attributed to a substandard implementation of NDSC in simulating the NICU/high care environment to that of the inter-uterine environment (McCormick et al., 2011; Ramachandran & Dutta, 2013; VandenBerg, 2007). This literature review will provide an outline of NICU and OT practice in a global and South African context, the current level of neonatal training received by occupational therapists, and knowledge translation in occupational therapy and neonatal care. The University of KwaZulu-Natal's libraries, google scholar and peer-reviewed articles shared by the research team of the more extensive study was utilised as a literature source. Phrases such as occupational therapy, knowledge translation, NICU, Neurodevelopmental supportive care and prematurity assisted in sourcing literature from the search engines.

1.5.2 Knowledge Translation (KT) in Health Care

Many resources are dedicated to research in the field of health sciences. A common discovery found in the literature indicates that there is disorganisation in the way that results or findings from research studies are put into practice (Graham et al., 2006; Moher et al., 2016; Warmington, Stothard, &

Snowling). Researchers from first world countries have predicted that 30-45% of people do not receive health care intervention that is evidence-based, and 20-25% of interventions are not needed or may pose as being harmful (Grol, 2001; Schuster, McGlynn, & Brook, 1998). Audits carried out in various settings have discovered that EBP is not consistently implemented in health care interventions. There has been an interest in recent years in investigating methods to decrease the knowledge to practice gap or knowledge to action (KTA) gap to encourage timeous EBP, that is feasible to patients in health care (Graham et al., 2006). There have been limited studies in Africa and South Africa investigating KT strategies in health care systems. A study conducted in Uganda investigated the implementation of policies in maintaining and promoting the sustainability of KT strategies in the Ugandan health care system. Several KT issues were identified; such as the ability of the health care system to synthesize evidence, health care workers not being familiar with KT initiatives, and a general lack of organisation in Uganda being able to sustain new national frameworks as well as existing ones within their health care system (Basaza, Kinegyere, Mutatina, & Sewankambo, 2018). In another study carried out in Canada, Zambia, and South Africa, a DEPICT model was created to pilot KT in health promotion. There were benefits and challenges in utilising the model. Still, overall, the pilot study generated various alliances with different stakeholders in LMIC's as well as with youth who have disabilities or are HIV positive in Canada (Flicker & Nixon, 2015). A study investigating the research methods of rehabilitation professionals who provide intervention to children with CP found that approaches to KT are not successful and only depict a 6% effectiveness in improving a professionals knowledge in using and implementing EBP (Adair, Ullenhag, Keen, Granlund, & Imms, 2015).

Frequent terms that are applied to the process of KTA are knowledge translation (KT), implementation, knowledge utilization, knowledge transfer, knowledge exchange and knowledge dissemination (Graham, Tetroe, Robinson, & Grimshaw, 2005). The term KT has become quite significant and commonly used in research in Canada (Davis et al., 2003; Jacobson, Butterill, & Goering, 2003). KT is described as being "the collaborative and systematic review, assessment, identification, aggregation and practical application of high-quality disability and rehabilitation research by key stakeholders (i.e., consumers, researchers, practitioners, policy makers) for the purpose of improving the lives of individuals with disabilities (National Center for Dissemination of Disability Research, 2005). KT is a method to EBP in which the most profound scientific research is combined with a health professionals clinical experience and expertise to make the best possible decisions with regards to a patient's health intervention (R. J. Jones & Santaguida, 2005; Sullivan & Cen, 2011). It is not only influenced by one's clinical experiences but also considers the patients belief systems, their personal characteristics, likings and dislikes; therefore, making KT an association between research evidence and clinical practice (MacDermid & Graham, 2009). The sole purpose of KT is to resolve the gap between research findings, synthesising knowledge and putting knowledge into practice by health practitioners and stakeholders (medical managers, policymakers, clinicians

etc.) to improve health care outcomes or systems in health establishments (Glasgow, Lichtenstein, & Marcus, 2003; Kothari & Wathen, 2013; Sudsawad, 2007). An integral part of the definition of KT, is appreciating that the process of its occurrence is within a multifaceted social organization of people who communicate regularly and transfer knowledge amongst each other (Graham et al., 2006; Tricco et al., 2015).

The process of KTA consists of knowledge creation and knowledge action. This process can be described as energetic yet intricate with both these concepts working simultaneously and influencing one another. Knowledge creation involves all the essential forms of research that have been published and provide EBP that can be utilised in health care systems. This knowledge is refined further until it becomes valid and useful to stakeholders in health care. This is conducted through the tailoring of expertise, by implementing the concepts of knowledge inquiry, knowledge synthesis and making use of knowledge tools (Graham et al., 2006). Knowledge synthesis consists of a combination of information that may already exist, with the process requiring the application of clear, duplicable approaches to identifying, appraising and synthesising research that are applied to precise research questions (Graham et al., 2006; Kastner et al., 2012). Knowledge tools may involve guidelines for practice, standard operating procedures, journal clubs, and referral pathways. These tools are useful in presenting easy, effective and efficient methods to present information and recommendations to stakeholders involved in health care systems (Hayward, Wilson, Tunis, Bass, & Guyatt, 1995; Ruggles, 2009).

Sustaining knowledge is part of the process of KTA. Managing the sustainability of knowledge requires the consistent assessing of disablers, designing interventions to address barriers, constant monitoring of how knowledge is being utilised and promoting the evaluation of knowledge on its first use right through its sustainment (Graham et al., 2006). There is a paucity in research relating to the investigation of KT interventions and its prolonged sustainability in health care systems upon its initiation and implementation (Chambers, 2015; Chambers, Glasgow, & Stange, 2013; Doyle et al., 2013; Proctor et al., 2015). The sustainment of KT interventions is of utmost importance in maintaining continued quality of care in health care establishments (E. M. Rogers, 2010; Scheirer, 2005; Wang et al., 2005). Several studies have discovered that KT interventions that have poor sustainability could have negative consequences in terms of a patient's quality of life in the long term (McGlynn et al., 2003; Scheirer, 2005; Stirman et al., 2012). Therefore, ensuring that there are continuous audits and evaluations within health care systems in relation to KT interventions and their sustainability becomes of utmost importance (Doyle et al., 2013; Proctor et al., 2015). However, there is still limited literature on sustainability in KT interventions with a potential for further research in the field in the future (Tricco et al., 2015). It is suggested that for KT interventions to be sustained there should be a plan set in place for when the actual design of the intervention is occurring (Graham, 2005).

Several studies have proposed that ongoing partnerships between academics, clinicians, policymakers, and others would promote the significance of research and its application within health care settings. The relationship between these two parties is known as integrated knowledge translation (IKT) (Kothari & Wathen, 2013; Van de Ven & Johnson, 2006). IKT is a process that produces knowledge via research for improving service delivery outcomes in the context of health care (Lohr & Steinwachs, 2002; Oborn, Barrett, Prince, & Racko, 2013). Research carried out in the area of decision making in health establishments has proved that difficult problems need practical solutions, together with the contribution of decision-makers and various professionals and experts who reflect, share different opinions, ideas and perspectives to develop, implement and appraise solutions (Denis, Hébert, Langley, Lozeau, & Trottier, 2002; Ross, Lavis, Rodriguez, Woodside, & Denis, 2003).

Researchers gain or benefit as they can understand the context, procedures, policies, create further research questions, and have their developed questions answered through ongoing communication with stakeholders who make decisions in health care establishments. These stakeholders know what they face daily, and therefore make it easier for researchers to understand the contextual background and conditions. This ultimately assists in improving the use of research results, and help in contributing to the function for IKT (Gagliardi, Berta, Kothari, Boyko, & Urquhart, 2015; Lapaige, 2010). It is known that IKT is a complicated process to initiate and endure due to disablers such as a lack of resources and low skills and knowledge; therefore it is not put into practice as often (Gagliardi & Dobrow, 2016). However, despite proof of EBP in IKT and the encouraging influence that it may have, it is not implemented or well-known globally leaving knowledge gaps for further research in the field (Gagliardi et al., 2015).

1.5.3 Knowledge Translation in Rehabilitation

Rehabilitation professionals are expected to utilise and integrate EBP with their clinical experience to offer the best possible intervention outcomes to their patients (Menon et al., 2009). The transference of EBP to rehabilitation professionals has been a complicated process, with gaps between the use of EBP and clinical application being identified (Funabashi, Warren, & Kawchuk, 2012). Research has acknowledged the gap between EBP and its implementation in clinical settings (Davis et al., 2003). The recognition of this gap has resulted in further research in KT. In comparison to other health professions such as nursing and medicine, rehabilitation professionals are of small numbers, and work in various clinical settings (Rappolt & Tassone, 2002). In recent years KT interventions in rehabilitation have become recognised (Menon et al., 2009; Scott et al., 2012). There are limited studies in the African and South Africa context focusing on KT in rehabilitation with specific disciplines focusing on KT strategies for particular diagnoses such as strokes and dysphagia (Cockburn et al.,

2014; Seedat, 2013). Professions such as OT, physical therapy and speech therapy have identified different disablers, and gaps in research and clinical practices, this suggests that a variety of KT interventions will be required (Rogers, Martin, & Force, 2009; Scott et al., 2012). KT can be described as a skill that is needed within the rehabilitation field of practice yet; there is a lack of evidence-based KT interventions that are available for rehabilitation professionals (Colquhoun, Letts, Law, MacDermid, & Missiuna, 2010).

Constant changes and new developments in rehabilitation intervention strategies encourage therapists to attend courses for continued professional development as required by their respective governing bodies. This assists in the integration of EBP (Funabashi et al., 2012). The methods of knowledge enquiry and KT are significant in filling the gap between research evidence and practical application in clinical settings (Graham & Tetroe, 2007). A systematic review investigating single and multiple KT interventions in OT, physical therapy and speech therapy found that interventions focused on meetings to provide talks or training, the provision of training materials and providing training for outreach visits (Jones, Roop, Pohar, Albrecht, & Scott, 2015). Meetings and training were the most used KT intervention amongst all three professions for EBP, together with the provision of training materials (Cochrane, 2005). All three professions possess the volition to want to increase their knowledge and skills to practice effectively as professionals (Bennett et al., 2003; Humphris et al., 2000).

Findings from a systematic review conducted with physical therapists in the United States found that multi-faceted KT interventions resulted in improved perceptions and knowledge as well as better-quality behaviours in clinical practice (C. J. Brown, Gottschalk, Van Ness, Fortinsky, & Tinetti, 2005; McQueen, 2008; Rebbeck, Maher, & Refshauge, 2006; Verhoef et al., 2004). These results are in line with other systematic reviews that included studies with health care professionals in which multi-faceted KT interventions were recognised to be effective in promoting EBP and changes in practice behaviours in clinical settings (Grimshaw et al., 2001; Grimshaw et al., 2004). Identified disablers of therapists in the application of research into clinical practice, are a poor understanding of research methods and processes, applying concepts that they do not understand from the research paper into practical application, as well as not having enough time to engage in EBP (Funabashi et al., 2012; MacDermid & Graham, 2009; Rappolt & Tassone, 2002). Further disablers are that therapists believe that there is a significant difference between research and clinical environments, there is a dislike amongst clinicians with regards to academic terminology and a large amount of information to comprehend, as well as a poor channel of dissemination of research information between clinicians and academics (Esteves, Pinheiro, Brás, Rodrigues, & O'Hara, 2010; Hurley, 2000; Jette et al., 2003; Metcalfe et al., 2001; Mitton, Adair, McKenzie, Patten, & Perry, 2007). Identifying which KT initiatives influence change in the attitudes of clinicians utilising EBP, is unclear from various literature reviews

(McQueen, Nivison, Husband, & Miller, 2006; Rebbeck et al., 2006; Stevenson, Lewis, & Hay, 2004). In other research studies that investigated the practical clinical skills of physical therapists and occupational therapists, it was found that most therapists used practical experience to guide their clinical work whilst only a few based their clinical work on EBP (Green, Gorenflo, & Wyszewianski, 2002; Wyszewianski & Green, 2000).

Research has identified practical methods to address disablers. It is suggested that the affiliation and communication between academics and clinicians should improve as it would allow for research to be relevant to clinical settings and provide realistic application ideas for clinical practice (Jette et al., 2003). Research should be prioritised in clinical areas that have the most need. This can be done by researchers and therapists working closely together to develop and identify relevant research-based clinical questions that therapists, patients and the health care system need to be addressed (Hurley, 2000). Recommendations on providing practical guidelines on how to apply research findings to clinical practice in easy to understand, reader-friendly formats, and making available summaries of appropriate treatment intervention strategies will encourage EBP amongst clinicians and allow for the correct application in the clinical care of patients (Jette et al., 2003). It is also recommended that research findings be published in journals that are easily accessible by clinicians and not only by the academic community, as well as promoting workshops, courses and training from academics for clinicians. This may assist in improving the knowledge enquiry, and KT process as well as improves the relationship and communication pathways between researchers and clinicians (Funabashi et al., 2012; Jette et al., 2003; Pain, Magill-Evans, Darrah, Hagler, & Warren, 2004).

There is an increasing awareness of the use of KT interventions in the field of OT, physical therapy and speech therapy, as there have been many journals exploring the area of KT in the past few years. Applying EBP in the clinical care of patients is a dynamic and complex method that needs intervention ideas and plans specific to the scope of rehabilitation, as well as taking into consideration the skills, knowledge and standards of care in that particular field of practice (Jones et al., 2015).

1.5.4 Knowledge Translation in OT

As EBP expands, studies indicate that results from research are not being implemented into the OT scope of practice (Cameron et al., 2005; Korner-Bitensky et al., 2006; Philibert, Snyder, Judd, & Windsor, 2003; Salls, Dolhi, Silverman, & Hansen, 2009). Research has found that the use of standardized assessments inpatient care by therapists is scarce (Chard, 2006), with many OT interventions not being evidence-based which is of no benefit to the patient (Tempest & Roden, 2008). Only a few therapists have been acknowledged in utilising research findings to guide their practical clinical skills (Salls et al., 2009). The disablers that have been identified in the integration of EBP in OT, are that therapists display decreased levels of skills, knowledge, and confidence to apply scientific

evidence into their daily practice. Therapists generally have a negative perception of research, a lack of time available to use EBP inpatient care, as well as therapists not receiving adequate administration assistance in their areas of work which leaves less time to engage with scientific evidence (Bennett et al., 2003; Humphris et al., 2000; Korner-Bitensky et al., 2006; McCluskey, 2003; Welch & Dawson, 2006).

Some studies thought that EBP allowed for minimum exploration in clinical practice whilst other studies viewed EBP in a positive and beneficial manner when utilised simultaneously with the current clinical practices that occupational therapists used (Copley, Turpin, & King, 2010; Poitras, Durand, Côté, & Tousignant, 2011). Studies have also found that clinicians hardly made use of scientific evidence in their intervention with patients (McKenna et al., 2005). The number of years of experience in clinical practice was recognised by therapists as a critical part of their knowledge, decision-making abilities, skills and evidence in everyday practise (Bennett et al., 2003; Copley et al., 2010). Many therapists engaged with senior therapists or colleagues who have more experience in the field, attended journal clubs and referred to textbooks (Lyons, Casey, Brown, Tseng, & McDonald, 2010). Aspects that influence the use of research in clinical care was identified in a study by Thomas and Law (2013), with many relating to a therapist's qualifications as an encouraging factor in making use of EBP. Therapists who have had post-graduate training have more confidence in clinical practice and utilise research findings in the care of their patients. Therapists who have graduated many years prior have shown to use less EBP, whilst those who supervise students feel autonomous and apply scientific evidence in their clinical practices (Thomas & Law, 2013). Engaging in research programmes with other occupational therapists working in the same field as well as with 'specialists' in a field of interest were also linked to an increased interest in utilising EBP. Other studies have found that changes in the leadership structure within a health organisation assists in supporting, promoting and encouraging occupational therapists to overcome disablers and utilise EBP (Lyons et al., 2010; Welch & Dawson, 2006). Clinicians prefer to be provided with quality summaries of research findings that are relevant to their field and context of clinical practice.

Furthermore, they wish to be given academic training, support, and a clear and concise understanding of what is expected of them in using EBP. These outcomes are aligned with research in the field of KT, in which it is suggested that KT interventions should include cognitive learning theories to allow for therapists to develop their knowledge in EBP and detect gaps in their clinical knowledge (Finlayson, Shevil, Mathiowetz, & Matuska, 2005; Karlsson & Törnquist, 2007; Petzold et al., 2012; Wensing, Bosch, & Grol, 2010). Studies investigating the effectiveness of KT interventions in OT, have found that focusing on disablers that prevent EBP, may show positive results in increasing knowledge, self-worth, and changing clinical practice behaviours (Thomas & Law, 2013).

A literature review conducted by Cochrane (2005), discovered that issuing training materials to therapists may increase their knowledge and behaviours in engaging with research evidence; however, it did not improve the intervention outcomes in the care of patients. There are gaps in the literature in identifying KT interventions that influence effective clinical practice in OT (Thomas & Law, 2013). Occupational therapists enjoy engaging in research practices; however, they prefer to consult colleagues, rely on their own clinical experiences, self-knowledge, and skills to inform their practice (Bennett et al., 2003; Cameron et al., 2005; Thomas & Law, 2013). A crucial step that was suggested in the literature in producing KT interventions for occupational therapists is to be aware of the disablers and enablers of the clinician and the context that they practice in. Four concepts have identified that need to be taken into consideration to evaluate the success of KT interventions in influencing changes in clinical practice namely the elements that the intervention consists of, the personal attributes of the therapist, elements of the conduct that the KT intervention is attempting to modify, and features of the health context in which the therapist practices (Logan & Graham, 1998; Menon et al., 2009). KT interventions need to correspond with a therapists clinical context, personal learning methods and their personality traits (Green et al., 2002). In general, occupational therapists believe that EBP does include not only research but also one's practical clinical experience, designing an intervention to the best interest of the patient, as well as taking the patients' needs into account (Copley et al., 2010). The results and continuous evaluation of KT interventions in OT need to be studied and explored further in enhancing the occupational therapist's knowledge and skills in the utilisation of EBP in clinical settings.

1.5.5 NICU and High Care Units globally

The NICU and high care unit admit new-born infants who are medically unstable and are at risk of mortality or morbidity. Infants may be admitted for various reasons such as prematurity, hypoxia, respiratory distress syndrome, neonatal sepsis, neonatal jaundice, congenital anomalies, low birth weights and other life-threatening conditions (Debelew, Afework, & Yalew, 2014; Hunter et al., 2015). These conditions also contribute to the high rates of infant mortality globally (Babaei & Dehghan, 2018; Debelew et al., 2014; Gauchan, DP, & Rao, 2012). The NICU and high care environments can be highly complex, as there is equipment that is utilised that may not be familiar to staff that did not have previous exposure and training in working with high-risk infants (Askin & Wilson, 2011). During admission in these unit's infants are medically unstable and susceptible to other health risks. Therefore the MDT plays a significant role in ensuring physiological homeostasis and neurodevelopmental support for the infant (Gauchan et al., 2012). In developed countries, NICU's are viewed as being a specialised area of practice, and the MDT working in this environment are required by medical facilities to have advanced training or postgraduate qualifications in this area (Nightlinger, 2011; Vergara et al., 2006). The environment of the NICU and high care units must be conducive and favourable to the neonate and the parent (Nair, Gupta, & Jatana, 2003).

As with other clinical departments in health care services, the medical model has always been the guiding force inpatient care. With research developing over decades in the field of paediatrics and neonatology there has been a significant focus on prioritising neurodevelopment of the neonate to improve functional outcomes later in life (Aucott, Donohue, Atkins, & Allen, 2002; Gorga, 1994; Laudert et al., 2007). Research into the management of the NICU environment, family centred care and planning individualized infant intervention programmes have expanded in medical, nursing, and rehabilitative professions (Orton, Olsen, Ong, Lester, & Spittle, 2018; Symington & Pinelli, 2006; VandenBerg, 2007). Encouraging parents to participate actively in the care of the high-risk infant in a stressful NICU environment has been recognised globally (Nair et al., 2003). Parents mental health and communication with the MDT with regards to their role in the NICU and high care environments have been promoted in the literature (Hutchinson, Spillet, & Cronin, 2012; Wigert, Blom, & Bry, 2014).

1.5.6 NICU and High care units in South Africa

Literature indicates that 98% of neonatal and perinatal morbidity rates happen in developing countries. This may be due to multiple factors such as being under-resourced in the public health sectors with regards to facilities, equipment, and human resources. Global causes of neonatal morbidity are aligned with causes of neonatal deaths in the South African context. A study at a KZN rural hospital indicated that causes of neonatal deaths included premature births and very low birth weight infants. The study also concluded that a better quality of care in our public health care system could reduce or avoid morbidity in neonates (Hoque et al., 2011).

The recognition of early childhood development and intervention is growing in under-resourced countries. Health departments in developing countries are beginning to advocate for childhood development and intervention programmes for infants, toddlers and older children who present with low birth weights, malnutrition, developmental delays, and other neurodevelopmental disorders (Grantham-McGregor et al., 2007; Kohli, 1990; Phatak, 2000). Information on medical and growth monitoring, developmental milestones, feeding practices and other valuable information is often accessible through the clinic Road to Health booklet (Engle et al., 2007). However, early intervention is still a problem in South Africa and other developing countries due to high levels of poverty, unreachable resources, and low literacy (SASLHA, 2011; Shung-King et al., 2019).

1.5.7 Neurodevelopmental Supportive Care (NDSC)

The care and survival rates of high-risk infants have improved over the decades. However, the exposure of the infant to the environmental stimuli of the NICU and high care environments persists (Goldstein, 2012; Shepley, 2004). The NDSC approach was developed to assist the infant in

transitioning between the in uterine environment and the NICU/high care environment in order to improve neurodevelopmental outcomes (Byers, 2003; Lubbe, 2010; VandenBerg, 2007). The model of synactive organization of behavioural development is the foundation of NDSC (Als, 1986). This model is identified as the source of NDSC and outlines how a high risk or preterm infant may experience disorganized behaviours due to neurodevelopmental and physiological instability from the highly stimulating NICU environment, resulting in their inability to cope to stabilise their autonomic, motor and self-regulatory subsystems (Legendre, Burtner, Martinez, & Crowe, 2011).

NDSC can be described as an inclusive approach as it is encompassed of various interventions that assist in facilitating the high-risk infant to regulate their sensory systems so that they can cope with the stressful NICU and high care environment. (Goldstein, 2012; Legendre et al., 2011; Ramachandran & Dutta, 2013). The focus of NDSC is to modify the environment, identify sleep and wake states and stress cues in the neonate, whilst applying calming techniques such as still hold, swaddling and Kangaroo Mother Care (KMC) (Goldstein, 2012; Jobe, 2014; Whipple, 2000). The synactive model describes infants as being actively involved in their care and wellbeing whilst they adapt and relate to the NICU and high care settings (Legendre et al., 2011). The interaction with the environment can also be influenced by the dynamic exchange between staff members, the infant and the parent (Vergara et al., 2006). NDSC is thus seen as an approach that not only focuses on the infant and their environment but places a high importance on family centred care and the mental health and wellbeing of the parent. An MDT approach in the NICU and high care environments in the transference of knowledge and skills amongst the various disciplines as well as with the family of the infant ensures consistency and continuity of care (Lubbe, 2010). Transference of knowledge and skills of the NDSC approach amongst those that are involved in the direct supervision of the infant will assist in the behavioural organisation, self-regulation, physiological homeostasis as well as to promote neurodevelopment of the infant so that the energy that they have conserved can be utilised to aid in their growth and recovery (Legendre et al., 2011; Lubbe, 2010; VandenBerg, 2007).

1.5.8 Best Practice Guidelines (BPG) for NDSC

The concept of NDSC was developed abroad. A group of academics and clinicians in South Africa worked together to make NDSC appropriate to the South African context. They engaged extensively with the literature to develop BPG that could be utilised by clinicians in the public and private sector (Lubbe, 2010; Lubbe et al., 2012). An integrative literature review conducted by Lubbe et al, 2012, summarised twenty-five statements and eighteen guidelines that was later synthesised into nine appropriate categories. This included NICU design, individualised care, the family centred care philosophy, positioning, handling techniques, managing the external environment, managing pain, knowledge of preterm infant development and preterm infant feeding methods (Lubbe et al., 2012). Literature in the field of NDSC in South Africa indicates that there is poor implementation of the nine

NDSC categories in the health sectors. A study conducted in the Free State province of South Africa discovered that health care professionals who were trained or familiar with the NDSC approach still did not implement it in their setting (Rakhetla, 2015).

1.5.9 The Occupational Therapists role in neonatal care – A global perspective

The field of neonatology has advanced over the last two decades resulting in OT also adapting and progressing with intervention strategies in the care of the neonate. Occupational therapists began providing therapy services to neonates in the year 1993 (Royal College of Occupational Therapists, 2017). It is an area of interest that has evolved significantly, with therapists around the globe following various practices and standards of care in supporting the neonate (Hunter, 1996). The OT scope of practice changed from focusing only on the sensory needs of the neonate to family centred practices, limited handling of the neonate, recognising behavioural cues as well as sleep and wake states (Gorga, 1994). The OT scope of practice and training serves as a foundation to make a meaningful influence and difference in the care of the neonate (Vergara et al., 2006). The role of the occupational therapist working in the NICU and high care units is to provide a full package of services in assessment, intervention, educating members of the MDT on NDSC, supporting the family of the neonate, and facilitating follow up appointments to monitor development into toddlerhood and beyond (Nightlinger, 2011; Rabinovich et al., 2018). Currently, intervention in the NICU is centred around the care of the neonate, their family and managing external factors in the stressful and fast-paced NICU environment (Lubbe, 2010).

The care of the neonate is based on the occupational therapists understanding and knowledge in neonatology, neurodevelopmental therapy, sensory integration, psychology, the ability to work in an MDT and relate to the complex needs of the infant-parent dyad and the NICU/high care environment. The therapist providing intervention in the NICU needs to have sound clinical reasoning skills and uses EBP in applying ethical and comprehensive services to the infant and family (DeLany et al., 2010). It is imperative that there is a good understanding of the medical aspects and risk factors (prenatal, perinatal and post-natal) associated with neonatal care, and the impact that it could have on infant development if intervention is provided carelessly (Lubbe, 2010). Sound knowledge of expected future developmental outcomes and functional prognosis of the neonate (abilities and inabilities), knowledge of new approaches created for OT practice in the NICU/high care unit, detailed knowledge and skills in the clinical care of high-risk infants and the formulation of individualized intervention programmes for the neonate and the family is crucial for the occupational therapist who services the NICU and high care (Vergara et al., 2006).

The family unit are recognised as being of utmost importance in the care of the neonate. Long admissions in the NICU/high care unit, and some units not allowing for the mother to stay with the

infant for long periods, may disrupt the foundation of attachment between the mother and the infant dyad. Therefore, the occupational therapist role in family centred care is significant. The therapist will liaise with the mother and the family at the hospital and at home to facilitate development, enhance the role of the parents in the care of the neonate, promote bonding and attachment and to ensure an easy transition from the NICU/high care to the home environment (Nightlinger, 2011; Olson & Baltman, 1994). The occupational therapist has a role in the adaptation and organising of the NICU/high care environment. The neonate who has been carried in utero and now has had a sudden and traumatic birth experience must adapt from the safety of the womb to the highly stressful hospital environment (Müller, Myburgh, & Stock, 2016; Rakhetla, 2015). The therapist who services the NICU should have knowledge of the various social and physical environmental factors, the NICU culture, and the impact that these factors may have on a neonate's neurodevelopment and neurobehavioural organisation (Vergara et al., 2006). The therapist's role is to educate and provide in-service training to the MDT on the management of the NICU/high care environments.

The role of the occupational therapist in the care of the neonate is to provide a service to the neonate, the family, and manage the NICU/High care environment simultaneously. Encouraging family centred care, translating knowledge amongst the MDT with regards to the OT role, environmental adaptations, and interventions are within the OT scope of practice (Nightlinger, 2011; Royal College of Occupational Therapists, 2017; Vergara et al., 2006). The literature indicates that a failure to implement individualised and family centred care in the NICU/high care may result in an undesirable neurodevelopmental outcome (Laudert et al., 2007). The OT role is to provide intervention directly and indirectly, as the therapist will address primary requirements that are essential in the development of the high-risk infant. In developed countries the OT is viewed as a "specialist" in the care of the infant, with regards to their physical, sensory, and emotional development, in assessing the ability of the infant being ready for feeds, splinting for congenital anomalies, positioning and parent support. The fundamentals in implementing the therapist's role in this area of practice are to address the needs of the MDT by providing ongoing education and training, having practical communication skills to engage with the MDT and the family of the infant and utilizing EBP to strengthen the role of the occupational therapist in the NICU/high care (Nightlinger, 2011).

1.5.10 Occupational therapy role in neonatal care – A South African perspective

Currently, within the South African context, there is a dearth in literature with regards to the OT role in the NICU or high care setting. A study conducted by a master's student from the University of Witwatersrand (WITS), researched the perceptions of the MDT with regards to standards of NDSC in the NICU. A quantitative, cross-sectional, descriptive survey design was used amongst rehabilitation professionals (paediatricians, doctors, nurses, occupational therapists, physiotherapists, dieticians and speech therapists) who work with high-risk infants in the NICU at two academic hospitals based

in the province of Gauteng South Africa (Butler, 2018). The results found that participants did not find their NICU's to be adherent to the standards of NDSC in term of NICU design, handling techniques, and individualised care. Participants perceived that their NICU's did adhere to the family centred care philosophy. Most participants received training on positioning infants in the NICU but agreed that extra training would be of benefit. Participants also considered their NICU's to be high risk due to not implementing the majority of the NDSC principles in terms of environmental modifications, feeding and pain management with infants. All participants believed that their respective NICU's applied an MDT approach as well as knowledge and skills sharing amongst the various disciplines (Butler, 2018). The study presented a bias as it was related to survey research (Podsakoff, MacKenzie, Lee, & Podsakoff, 2003). This is due to participants seeing the need to provide answers to the survey that they thought were most correct or applicable. The MDT may have adhered to the NDSC philosophy imitating the ideal environment for the NICU (Butler, 2018).

A pilot study carried out by honours students from the University of Witwatersrand (WITS) researched the training and role of occupational therapist in the NICU in South Africa. A quantitative, cross-sectional, descriptive survey design was utilised for the study (Müller et al., 2016). Therapists who participated in the study were required to be registered with the Occupational Therapy Association of South Africa (OTASA). Experience working in the NICU was not in the inclusion criteria (Müller et al., 2016). Results from this study discovered that there is a lack of skills and knowledge relating to working in the NICU. These results may be due to insufficient undergraduate training in understanding the OT role in NICU and with neonatal care (Müller et al., 2016). It was further discovered that community service therapists in South Africa were still required to provide neonatal services and work in NICU's despite their limited knowledge in the field (Müller et al., 2016). Limitations in the study were that it only included therapists that were registered with OTASA. There was also not a good response to participation in the study. Using a questionnaire in the study may have prevented further divulsion into the topic as well as the convenience sampling might have developed a bias (Müller et al., 2016).

A study conducted by a master's student from the University of KwaZulu-Natal (UKZN) investigated the experiences of community service therapists who work in the NICU in the province of KZN, South Africa. An explorative, qualitative design was used via in-depth interviews with occupational therapists who were not more than four-years post community service. Results from this study identified that junior therapists had to work through challenges in the complex NICU environment despite not having adequate skills, knowledge and experience (Hardy et al., 2020). Community service therapists had to adapt to the NICU by learning about the equipment, and the various diagnoses without receiving supervision from experienced therapists in the field. Participants in the study voiced the challenges felt in the NICU whilst understanding and discovering their roles in the NICU environment (Hardy et al., 2020). Therapists felt a desire to become better and more confident in the field of neonatal care

through their exposure to the NICU. The NICU setting was a highly pressured and stressful environment resulting in participants developing their coping strategies to meet the work demands (Hardy et al., 2020). Limitations of the study were that it only included therapists with experience working in the NICU between the year 2014 and 2017 in the province of KZN. A possible response bias to the invitation to study could have occurred with therapists who had a negative experience in the NICU or who did not feel competent in neonatal care (Hardy et al., 2020).

1.5.11 Occupational Therapy undergraduate and post graduate training in NICU practice

According to the World Federation of Occupational Therapists (WFOT) the undergraduate training in OT at recognised institutions globally, should include six areas of competency (Hocking & Ness, 2016). These six areas consist of the understanding of the person, occupation, environment, and its relation to healthcare, building relationships with members of the MDT, applying OT procedures, clinical reasoning, assessment, and treatment, as well as considering the environment that accompanies practicing as a professional and applying EBP to ensure quality clinical services. Contents of curriculums globally are based on the culture, social aspects, and institutional requirements of the country and local contexts. Therefore, the WFOT does not specify that the undergraduate curriculum should include knowledge and skills in the NICU but rather focusing on ECI that focuses on development, child psychiatry, sensory systems, and environmental components that result in difficult behaviours and learning problems (Hocking & Ness, 2016).

The Health Professions Council of South Africa (HPCSA) guidelines indicates that the OT undergraduate curriculum in South Africa must cover six months in the field of paediatrics over a four degree. This includes fieldwork in paediatrics. The curriculum must comprise of the study of human anatomy, physiology, understanding diseases, trauma, human behaviours, occupational areas and performance skills and patterns, research, and community-based rehabilitation. The minimum standards guideline does not stipulate topics that should be covered in the field of paediatrics but specifies that certain treatment techniques should be taught to optimise interventions i.e., visual perceptual standardised testing, groupwork, neurodevelopmental therapy and basic sensory integration (HPCSA, 2019). Various tertiary institutions in South Africa develop their own curriculums guided by the WFOT and HPCSA requirements. The assessment and intervention training related to neonates as an undergraduate, as well as compulsory or available post graduate training in the field is not mentioned in the guideline. However, the HPCSA has compulsory requirements for qualified health professionals for continuous professional development in areas of special interest. It is therefore the responsibility of the clinician to find and source further training in neonatal care. OT's are required to obtain a minimum of 30 continuous education units, and 5 units for ethics, human rights, and health law over a twelve-month period. Units are valid for two-years (HPCSA, 2017).

The American Occupational Therapy Association (AOTA) published a NICU Knowledge and Skills Paper as an orientation for OT's who provide intervention to high-risk infants and families. This paper specifies that working in the NICU requires OT's to have years of clinical experience in paediatrics, and progressive knowledge of medical conditions, the progression of diseases, mental health, child and family development and skills in neonatal interventions (Rabinovich et al., 2018; Vergara et al., 2006). It is further described that the NICU OT should have advanced skills, expertise, and knowledge in applying complex treatment modalities with infants and families, experience in monitoring development of high-risk infants and building collaborative relationships with families (Nelson, 2006). NICU practice is not an area for junior therapists or for therapists with little to no paediatric experience (Vergara et al., 2006). Post graduate training and continuous professional development in the field of neonatal care must be available through supervised mentoring until the OT proves competent in providing intervention to the infant and parent dyad (Clark et al., 2009). A therapist can attend further training, courses, and workshops funded by themselves or their employers, contribute to study groups with other therapists, use EBP and appropriate literature, as well as relevant tools to apply suitable and ethical intervention in the NICU and to keep current with their knowledge and skills (DEd et al., 2010).

1.6 METHODOLOGY

1.6.1 Introduction

This study uses a qualitative exploratory inquiry research approach. The research design guided by the conceptual framework allowed for the aim of this study to be achieved; as it offered a positive way to explore, discover possibilities and dream towards a shared vision of KT, and the ideal neonatal care within the OT profession in the public health sector of KZN. This chapter will describe the progression in the methodology, which includes the research design, the study location, the population of the study, the study sample procedure, data collection strategies, data management and data analysis. The process that was used to warrant reliability and the ethical considerations of the study will also be conferred.

1.6.2 Research Design

Qualitative exploratory research is an esteemed method of investigation, and the intricacy brings rigour to the methodology to develop valuable outcomes (Nowell, Norris, White, & Moules, 2017). Qualitative research explores topics or areas in which there is a paucity of research and literature (Lundberg, 2003). This research design aims to describe the experiences of a group, and therefore focuses on the narrative, whilst also allowing the researcher to gain insight and explore further (Silverman, 2016; Sutton & Austin, 2015). A conceptual framework was used to guide the qualitative exploratory research design that focuses on the participation, strengths and assets of an individual

and their organisation. It aims to discover what is working, assuming that there are resolutions within the organisation that may already exist (McKenzie, 2003). Generating qualitative research discussions amongst occupational therapists in the public health sector guided by the conceptual framework aids in participants focusing on the positive about themselves, and their organisation as they are provided with the opportunity to speak freely and be understood by others in similar environments. This qualitative exploratory research design will inquire and seek to understand and gain insight into the practice of full time employed occupational therapists who provide intervention and support to neonates in the public health sector of KZN.

1.6.3 Conceptual Framework

The main aim of the conceptual framework is to report on concepts that are relevant to the study and to indicate the relationship between them (Rocco & Plakhotnik, 2009). The approach of Appreciative Inquiry (AI) and the KT process was utilised to create the conceptual framework of this study and inquiry. The aims and objectives of the study were guided by the conceptual framework of AI and KT, therefore making them essential to understand. The conceptual framework was also used in the analysis of the data as it shaped the findings of the study.

The AI approach is described as focusing on “asking the unconditional positive question to ignite transformative dialogue and action within human systems” (Ludema, Cooperrider, & Barett, 2006, p. 1). AI is encompassed of four essential phases. The phases include discovery, dream, design and destiny. As part of the development of the conceptual framework of the study and inquiry, the discovery and dream phases were utilised. The first two phases of the AI approach were used to develop and direct the presentation style of the data collection instrument. The inner circle of the diagram shows the discovery phase, which was used to pursue, explore and highlight aspects that motivate organisations, despite the difficulties and barriers that therapists may encounter. This process allowed for positive factors to be acknowledged so that, appreciation of what is good is highlighted (Ludema, Cooperrider, & Barrett, 2006). The ability to focus on what is best, paves the way to constructing a dynamic future, without emphasising negativity, this allows for therapists to reflect on innovative possibilities for change and development (Watkins, Dewar, & Kennedy, 2016).

The AI approach recognises the finest qualities in people and their surroundings; it acknowledges and seeks to identify potential, opportunities, strengths, achievements and the abilities that drive people and the organizations that they belong to (Barrett, 1998). The AI approach does not place importance on the negative factors to find solutions, instead it will investigate what is working and emphasises this. AI believes that people and the organisations they belong to, have their strengths and positive factors, and if these are focused on, it will drive them to accomplish their goals. Using the concepts of the discovery and dream aspects of the AI approach, assisted in maintaining open-ended questions

and encouraged dynamic discussions amongst participants in the focus groups. The content of the data collection tool was designed to understand the KT process amongst occupational therapists employed full time in the public health sector of KZN.

Questions aligned with the principles of KT such as knowledge enquiry, knowledge synthesis, sustaining knowledge and knowledge utilisation in the care of the high-risk infant in the public health sector (Kothari & Wathen, 2013). This promoted a discussion amongst therapists about how they enquire knowledge to intervene in the NICU/high care units and support the high-risk infant, as well as how they synthesise and sustain the information that they source and utilise and adapt this knowledge to their specific contextual needs. The outer circle of the conceptual framework being dream allowed for therapists to envision through the research discussion, who the ideal therapist for the NICU should be, what is the ideal to share and sustain knowledge amongst therapists who work in neonatal care, what would an ideal toolbox for the NICU consist of, as well as what an ideal day in the NICU should look like for the occupational therapist. The conceptual framework using the discovery and dream phases of the AI approach stimulates curiosity and encourages learning for larger group change; therefore the core of the organisation that is built on positive potential and wisdom brings hope for the possibility of change in the future with regards to the care and support provided by occupational therapists in the KZN public health sector (Cram, 2010).

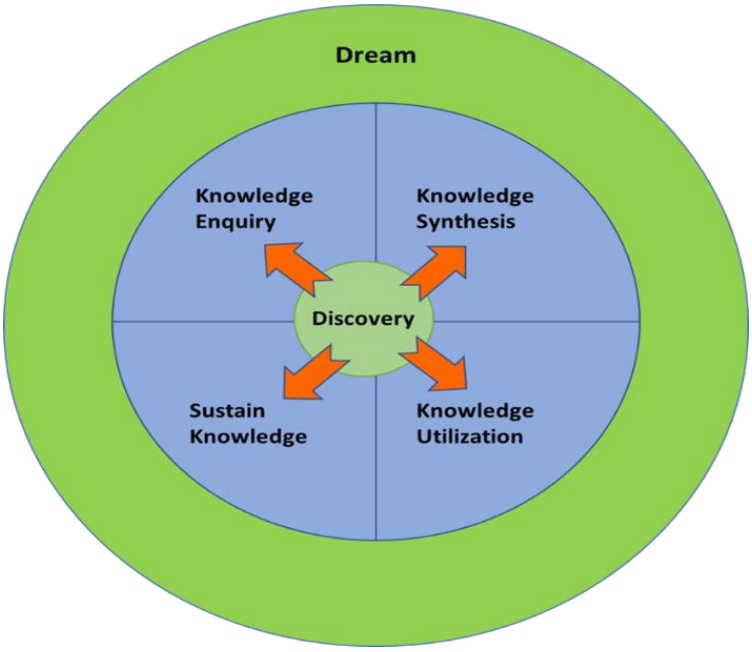


Figure 2 Conceptual framework of the study

1.6.4 Formulation of Qualitative Questions

Guided by a conceptual framework, this allowed for discussions that focused on what is being done with regards to neonatal interventions; it allowed for thinking, curiosity and inspiration towards envisioning endless possibilities for neonatal care within various levels in public health institutions (Cooperrider & Whitney, 2001). The discovery phase of the framework kept in line with the principles of KT in the development of the questions for the qualitative exploratory research design. Questions aligned with discovering knowledge enquiry, knowledge utilization, knowledge synthesis and sustaining knowledge on the care of the neonate by occupational therapists. (Appendix A)

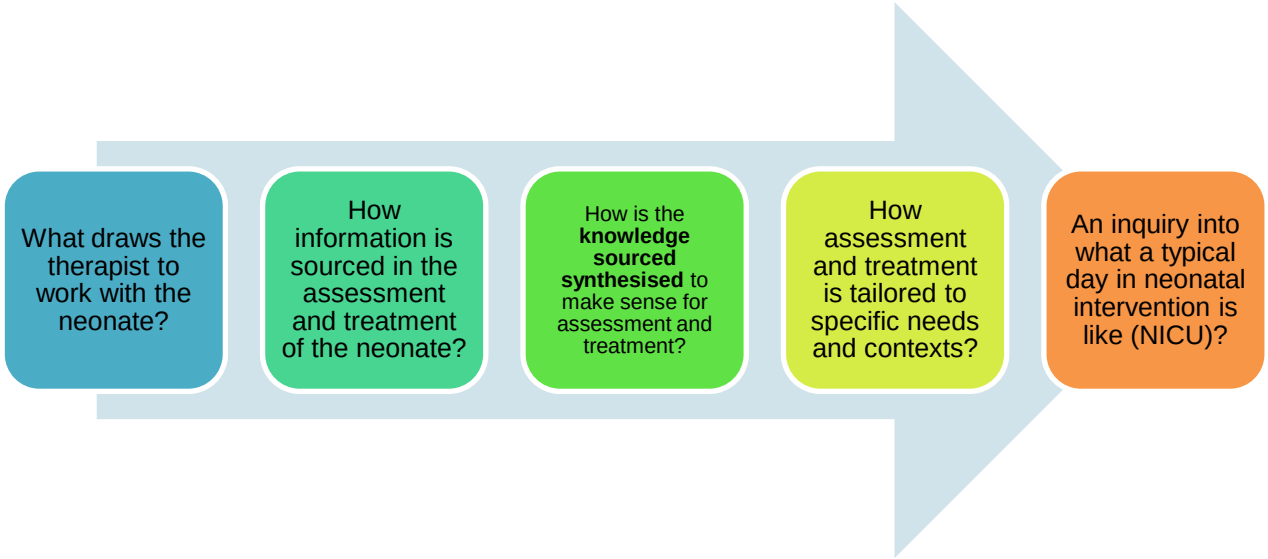


Figure 3 Formulation of the qualitative questions (Discovery - knowledge enquiry, knowledge synthesis and knowledge utilisation) (Cooperrider & Whitney, 2001; Kothari & Wathen, 2013).

The conceptual framework also guided the second phase of the research discussion. The dream phase utilised the information and insights gathered from the discovery phase and put it to beneficial use. As therapists were inspired by their own stories and achievements during the previous phase, it began to form an outline of what could become a reality (Ludema et al., 2006). Further qualitative questions were developed, keeping in line with the specific context of the therapist appendix A.

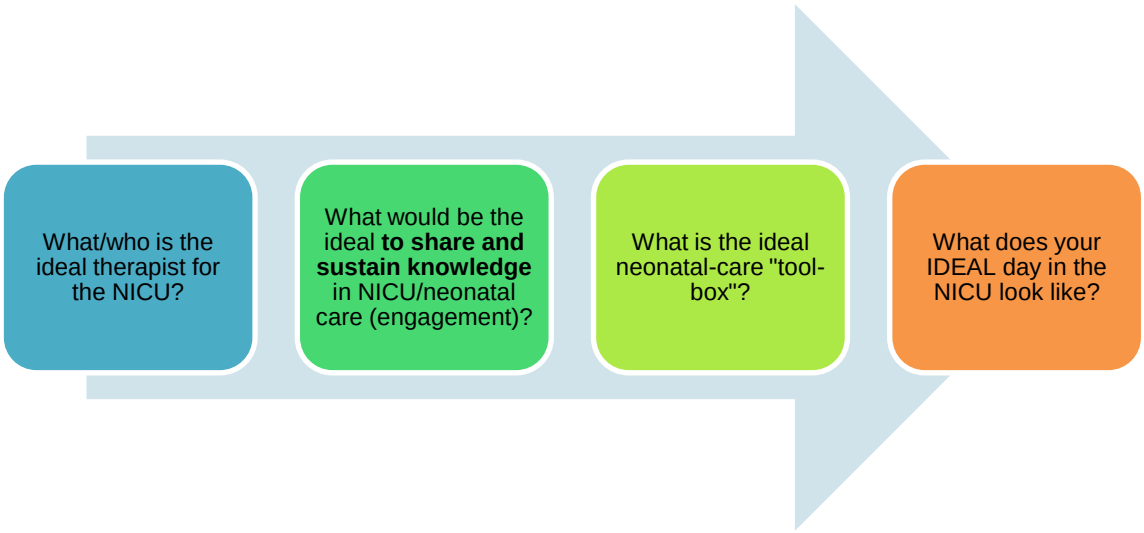


Figure 4 Formulation of the qualitative questions (Dream of the ideal and sustaining knowledge in neonatal care) (Cooperrider & Whitney, 2001; Kothari & Wathen, 2013).

1.6.5 Study Setting

The province of KZN, South Africa consists of ten districts (Umkhanyakude, Zululand, Ethekwini, Amajuba, Umzinyathi, Uthukela, King Cetshwayo, Ilembe, Umgungundlovu, Harry Gwala and Ugu). The study setting included six of the districts in the province of KZN, as therapists employed in the other four districts did not respond to the invitation to participate in the study.

Figure 5 Map of the districts in the province of KZN, including an outline of districts that were represented in the study

1.6.6 Selection of Participants

1.6.6.1 Population

Participants included in the study, are full time employed occupational therapists who work with neonates and high-risk infants in various levelled (District, Regional and Tertiary) public health institutions across the province of KZN. The therapist from the only central hospital in the province did not participate in the study. Therapists in a community health care centre (CHC) were not included in the study as CHC's do not provide acute care to neonates. They do not have NICU's, High care and KMC units. Neonates who are at risk are followed up at high-risk baby clinics within District, Regional, and Tertiary institutions as the full MDT is available. Once a patient is stabilised and ready for further early childhood intervention, they may be down referred to CHC's.

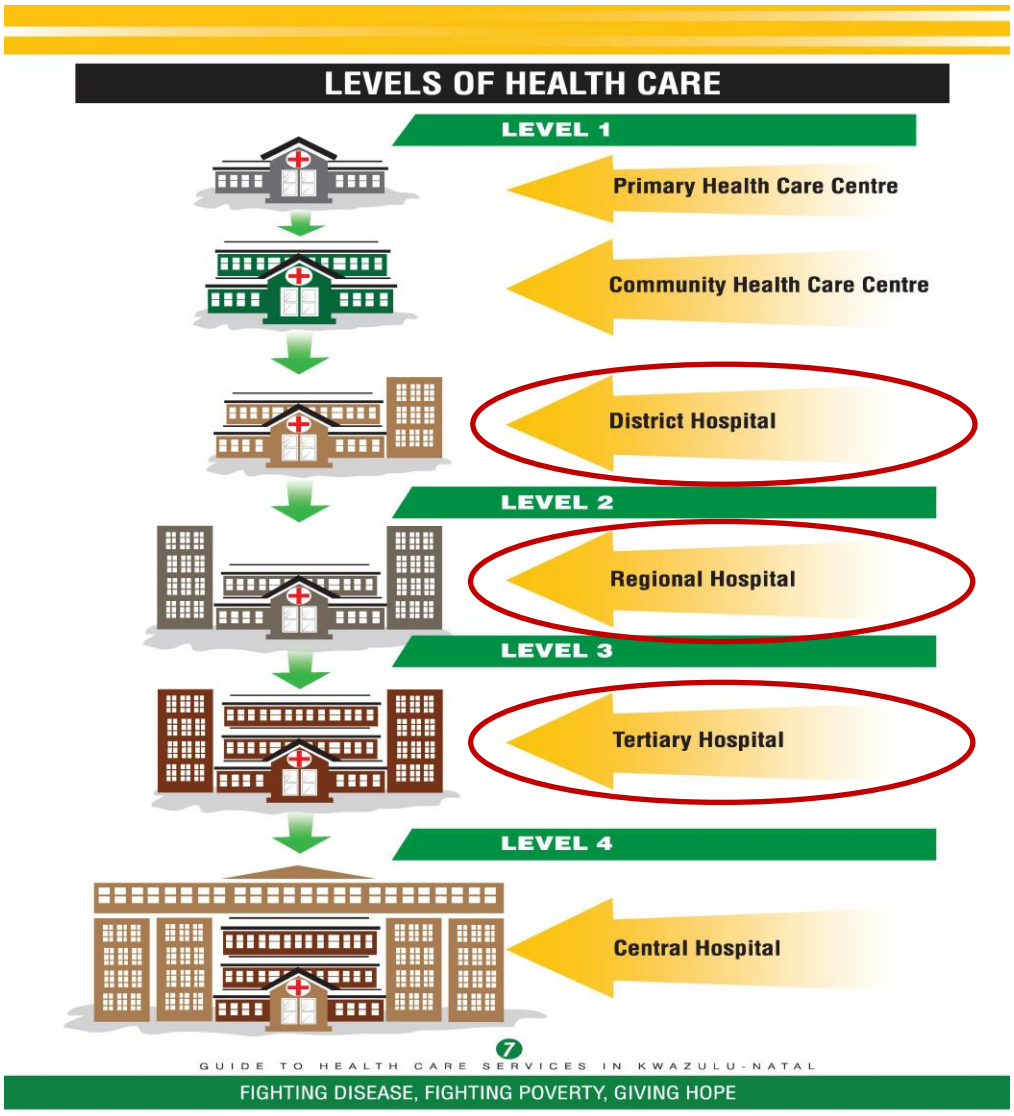


Figure 6 Levels of health care institutions in the province of KZN. Levels of care included in this study are circled. (Source: www.kznhealth.gov.za)

1.6.6.2 Sampling Technique and Size

The participants included in the discussion groups were selected using a purposive non-probability sampling technique (Hungler, Beck, & Polit, 1997). The participants were selected based on the aim and purpose of the study requiring a stakeholder input. It was expected when choosing the sample, that each participant would give exclusive, valuable and unique information to the study (Etikan, Musa, & Alkassim, 2016). Total population sampling (TPS) is a method of purposive sampling in which a population that meets the selection criteria are included in the research study. In this study that would include full-time occupational therapists who work with neonates, or high-risk infants, and who are employed in various public health institutions in the province of KZN, South Africa. They were chosen as the primary sample for their continuous experience in the care of the high-risk infant in the public health sector as compared to junior therapists who are employed on an annual contract which is later terminated. Therefore, they would be able to understand and comprehend the questions related to the aim of the study. TPS is typically used with small sample sizes; therefore it is applicable to this study as the number of occupational therapists permanently employed in the province of KZN has drastically decreased to 45% since the year 2016 due to the moratorium placed on allied health professions (KZN OT Forum, 2019a). Current staffing levels in the KZN province are 6 OT Assistant Directors, 22 Chief OTs, and 40 production level OTs across 91 facilities (KZN OT Forum, 2019b).

A list of full-time occupational therapists in the province was compiled by the provincial OT Forum using the information provided by therapists. Information was provided voluntarily. The list consisted of details such as the institution that therapists were employed in, their names, email addresses, work telephone numbers and cell phone numbers. Consent from all therapists was obtained for these details to be shared via OT district representatives to other therapists in their respective districts keeping in line with the Protection of Personal Information (PoPI) Act, 2013 (Information Regulator South Africa, 2013). The list was compiled to be used as part of a mentorship programme in which junior therapists in the province were able to locate and contact senior therapists for clinical advice, as well as a referral pathway source for therapists to utilise when referring patients to other institutions. The head of paediatric and child health for the province of KZN, Dr Neil McKerrow was contacted to enquire which hospitals had functioning neonatal units (NICU'S. high care and KMC), with his assistance as well as that of the neonatal coordinator for the province Ms. Ruth Davidge, the researcher was able to compile a list of relevant public institutions. This was then compared to those institutions that had full-time occupational therapists employed. Other institutions that were not mentioned by Dr McKerrow and Ms Davidge were contacted individually to inquire whether the full-time occupational therapists provided intervention to high-risk infants.

The total population indicated for the study was 46 full time employed occupational therapists who work with neonates or high-risk infants in public health institutions within the province of KZN. A list of all prospective therapists that met the inclusion criteria was collated by the researcher using the information provided by the KZN OT Forum as described above. Therapists were each contacted telephonically to be invited to the research discussion. A brief explanation of the research study was given to therapists who were interested in participating as well as inquiring whether they fitted the inclusion criteria to be included in the study sample. A formal invite was thereafter sent via email (Appendix B) The details of the proposed date and times for the focus group discussions was also discussed.

Two therapists indicated that although their institutions provided intervention to neonates, they preferred to work in other rehabilitation areas (physical, neurology, orthopaedics etc.) and left the scope of paediatrics to their colleagues, who were included in this study. This brought the TPS to 44 occupational therapists. The total population sample that participated in the research discussion were 17 (n=17) (38.63% of the total sample indicated) occupational therapists. Two therapists who agreed to join the discussion were unable to participate on the day due to personal reasons and poor internet connectivity. Participants who joined the discussion did so, based on personal choice, convenience and availability (Creswell, 2005). The ethics certificate was sent to therapists whose hospital management required the document, to allow them to participate in the research discussion. All hospitals represented in this study have functional NICU's, high care, and KMC units of various sizes and varying equipment and provide intervention to high-risk infants as inpatient and outpatients.

Inclusion Criteria

1. Public hospitals in the province of KZN who provide neonatal intervention in NICU's, high care, KMC units and outpatient neonatal care.
2. District, regional and tertiary public health institutions.
3. Full time employed occupational therapists who have two years of clinical experience post completion of community service.
4. Full time occupational therapists who provide intervention to neonates.
5. Full time occupational therapists who are registered with the Health Professions Council of South Africa.

Exclusion Criteria

1. Community service occupational therapists. Various institutions in the KZN public sector have only community service occupational therapists with no full-time therapists to provide direct clinical supervision, therefore these institutions were not included in this study.

2. Full time employed occupational therapists with less than two years clinical experience post completion of community service.
3. Occupational therapists who are employed full time but do not work with neonates.

1.6.7 Data Collection Instrument

The instrument used in this study was a discussion focus group. The initial questions for the discussion schedule were developed by the researcher and were then reviewed and further refined during a team meeting with the research supervisors and co-facilitator. Upon discussions and additional directive, the questions were refined within a theoretical framework to focus on occupational therapists that worked with neonates or high-risk infants supported by evidence found in the literature and clinical experiences of both the researcher, co-facilitator and supervisors. The questions in the instrument were relative to the research question, aim and objectives of the study which emphasised "knowledge to practice gaps" and "ideal knowledge to practice interventions" with occupational therapists in the public health sector of KZN. The method in which the questions were phrased as well as expected outcomes and prompting by the facilitator and co-facilitator were recorded on a chart and later onto a word document (Appendix A). This allowed for further questioning, prompting and guidance with participants during the focus group.

Data Collection Procedure in the period of the South African "lockdown" due to the COVID19 pandemic

- Several meetings took place with the research team before the data collection. Three face to face meetings, one Skype meeting and one ZOOM meeting.
- An invite to the discussion was drafted and saved in PDF formats and emailed to each prospective participant (Appendix B).
- Initially, the data collection process was meant to be conducted in a face-to-face workshop format with materials that would be available for expression of thoughts followed by a discussion and collation of common themes and ideas amongst participants. Participants were meant to be accommodated in a comfortable setting at the University of KwaZulu-Natal, Westville campus with a maximum of three hours allocated for data collection.
- Upon the South African government's decision to initiate a nationwide lockdown due to the Corona Virus (COVID19) pandemic globally, there became a need for researchers to explore alternate methods for qualitative data collection due to social distancing guidelines (Lobe, Morgan, & Hoffman, 2020).
- It was decided by the University of KwaZulu-Natal (UKZN Biomedical Research Ethics Committee (BREC) that "all non-therapeutic or non-interventional research involving contact with human participants should be suspended, except for social science studies involving telephonic or other

online/remote methods of data collection. Where feasible, researchers may, with the consent of their participants, switch from face-to-face to remote (e.g., online, telephonic) data collection. If this switch is implemented, the researcher must record the participant's consent and ensure that the participant's privacy is protected if sensitive information is elicited that might be overheard."

- The research team came to a decision that an invitation to face to face discussions would be cancelled and that an online data collection would be arranged via ZOOM. ZOOM is a video call application with a built-in recording function that already has a reputation in being used for research amongst academics globally (Archibald, Ambagtsheer, Casey, & Lawless, 2019; Daniels, Gillen, Casson, & Wilson, 2019; Kite & Phongsavan, 2017; Lobe, 2017; Matthews, Baird, & Duchesne, 2018).
- The ZOOM Pro plan subscription was used to ensure that there were more than 40 minutes allocated to an online session. This ensured that there were no disruptions during the discussions. Using an online platform for data collection still represents the traditional qualitative focus group discussions (Chen & Hinton, 1999).
- New invites were constructed to invite participants to the online discussion on the electronic platform ZOOM. Participants were advised that they would be sent a link via email to join the discussion. They would be able to join the meeting by clicking on the link and filling their names or initials in. They could also download the ZOOM application on their laptops, computers, or smartphones if they wished to do so.
- Participants were contacted telephonically to address any concerns or difficulties that they may experience with using ZOOM. They were given instructions on how ZOOM works and advised to have a good working internet connection and a quiet room to ensure privacy and confidentiality for themselves and other participants (Appendix D). Due to some participants having busy workdays and an unstable internet connection during the day, an evening discussion was offered to accommodate these participants. Participants were also advised that all agreeable participants were permanently employed occupational therapists from the public health sector of KZN.
- Participants were contacted telephonically once more, and a new invite was emailed to all of them. Possible participants were required to have access to a computer or a smartphone (Lobe et al., 2020).
- Two discussion sessions (afternoon and evening) took place with willing participants on the 08/04/2020 for 1.5 hours each. The discussion time with two groups of occupational therapists totalled to 3 hours. 8 therapists participated in the afternoon group, and 9 in the evening group. Discussions followed the conceptual framework design. Participants were facilitated by specific questions relating to the aims and objectives of the study and were provided with prompts by the researcher and the co-facilitator who is an occupational therapist and familiar with the study and the research design. Participants were encouraged to speak freely and shared their experiences,

information, and ideas amongst each other. It is advised in the literature that when the researcher is far from the participants as with online discussions, it may prove to be challenging to facilitate the discussion. Therefore it would be helpful to have guidelines sent to the participant prior to the discussion (Lobe et al., 2020). A guideline of the data collection plan was developed by the researcher and peer reviewed by the co-facilitator.

- Participants were encouraged to keep their videos on so that the researcher was able to make non-verbal observations and engage with participants by determining whether they wanted to contribute to the discussion E.g., putting their hand up to speak (Appendix D). Participants were asked to mute their device audio until they were ready to speak. However, keeping videos on was not a standard requirement as it could affect the bandwidth and internet connectivity which may have caused disruptions during the discussions. Participants were urged to use the raise hand function on ZOOM, especially if their cameras were turned off. They were informed that the discussions will be recorded for transcription purposes via ZOOM, their privacy would be protected and that the recordings would be stored in an appropriate and safe place. Privacy was further ensured by providing a meeting password to all participants. This ensured that no unwanted persons entered the meeting.

1.6.8 Pilot Study

Due to the COVID 19 pandemic limiting face to face group discussions, a typical pilot discussion could not be conducted. Furthermore, all willing permanent therapists who met the criteria for the study agreed to contribute to the actual research discussion. A pilot discussion focus group was simulated on ZOOM by the researcher, and a co-facilitator, as well as two junior occupational therapists prior to the actual discussions. The pilot allowed the researcher to go through, asking the set questions from the data collection instrument. From the pilot study, problems identified in the presentation style of the questions and in the way that the discussions would be facilitated were acknowledged by the researcher. The major issue identified was that of internet connectivity and the background noise from the participants video calls. This would interrupt participants as well as the quality of the discussion recordings which later needed to be transcribed. Necessary adjustments, such as ensuring a good internet connection from the researcher was arranged. Participants were informed that a good internet connection would be needed for the online discussions and those who participated tried their best to ensure that this was possible.

1.6.9 Questionnaire for Demographic Information

A Microsoft Word electronic demographic questionnaire (Appendix E) was developed and sent to all participants via their private email addresses prior to the research discussions. The questionnaire required participants to tick the box that was most applicable to them with one short question at the

end. The questionnaire included questions such as the gender of the therapist, the number of years of experience, the level of care that they are employed in within the public sector, and whether they have received further training or attended any courses in the care of the high-risk infant. The questionnaires were all filled and sent back timeously by participants. The information obtained via the demographic questionnaires was collated in a word document (Appendix F) and applied to the table below.

Table 1: Participant demographic information (n=17)

Gender	**Male**		**Female**	
	1		16	
Neonatal training	Yes		No	
	11		7	
Level of care	**District**		**Regional**	**Tertiary**
	10		4	3
Years of experience	**2-5 years**	**5-10 years**	**10-15 years**	**>15 years**
	5	7	2	3

Reasoning as to why participants did not receive training or go on courses for neonates as well as for those who have received training or went on courses, are documented in detail in the collated word document (Appendix F).

1.6.10 Data Safety and Monitoring Plan

In all research studies there must be proper ethical procedures once the data is received (Anderson & Corneli, 2017). Demographic data was collected via Microsoft Word electronic questionnaires and after that stored on a password secured online database (Google Drive) that is only accessible to the researcher. Audio recordings and transcriptions of the discussions with participants have been stored on an online database (Dropbox), which is only available to the research team consisting of the co facilitator and supervisors of this study. These files will be kept for further analysis if needed in the future by the research team. There are no hard copies available that have been used to collect data from this study.

1.6.11 Data Analysis

A pertinent method of qualitative research is thematic analysis. A thematic analysis assists in identifying common ideas and patterns from the available data, therefore allowing for the creation of successive and distinct themes (Braun & Clarke, 2006). A hybrid approach that included a shared data-driven inductive and deductive method was utilised to demonstrate rigor in the thematic analysis (Fereday & Muir-Cochrane, 2006). Rigour can be defined as representing honesty and capability in

the research process (Aroni et al., 1999). Documenting of evidence through the process of the research displays credibility, validity and trustworthiness in the research method (Koch, 1994). Using the hybrid approach to analyse the data, compliments the instrument questions by allowing the principle of KT and OT in the care of the high-risk infant to be fundamental in the method of deductive reasoning whilst still letting themes emerge from the data using inductive reasoning (Fereday & Muir-Cochrane, 2006). The discussions were recorded using the record feature of the ZOOM electronic platform with the permission and verbal consent of participants. An inductive and deductive thematic analysis was utilised to code and analyse the data. An inductive and deductive analysis of the data is described in the steps below:

1. The audio recordings were listened to carefully and thoroughly by the researcher to begin the coding process to identify important information and ideas. This was then encoded before progressing to interpretation (Boyatzis, 1998) (Appendix G). Encoding assisted in the organising of the data to derive common themes and ideas that developed from the discussions.

2. The recordings of the discussions allowed for the audio to be replayed repeatedly so that a precise transcription was done by a research assistant who is part of the research team. A comprehensive understanding of the data collected was done by the researcher through reviewing and revising each transcription to ensure accuracy (Creswell & Creswell, 2017; Fereday & Muir-Cochrane, 2006).

3. Participants were sent a summary of the findings as well as the transcripts for review. No corrections were identified by participants for amendment.

4. The transcribed data from the discussions was imported into the software NVivo (version 12 Pro). This data management programme was used to assist in organising the data. The coding process involved reducing the data within specific nodes or themes (Miles & Huberman, 1994) and ensuring that the themes captured, were as authentic as possible taking each objective of the study into account. Initial nodes were identified and categorised followed by sub nodes (Braun & Clarke, 2006). The relevant verbatim responses were highlighted within the nodes and sub nodes to support the findings. They are direct quotes that has emerged from the data that was transcribed (Miles & Huberman, 1994; Saldaña, 2009).

5. The coded data were utilised to develop possible themes. The data were shared with the co-facilitator of the discussion for peer debriefing. On completion of the debriefing, it was agreed that other sub-nodes should be created to ensure further authenticity. This was carried through by the researcher. Triangulation can be described as making use of numerous sources of data, models,

and methodology to provide valuable information to a study (Graham, 2005; Heale & Forbes, 2013). Data triangulation was conducted by sharing the coded data from the transcripts with the co-facilitator and supervisors of the research study to ensure trustworthiness, and to counter research insider bias. This allowed for a connection to be created amongst the data sources, achieving clarity and less adverse results in the formation of concurrent data (Creswell & Creswell, 2017). The researcher was subsequently able to organise the codes into emergent themes (Braun & Clarke, 2006).

6. A thematic network was generated on the NVivo programme to demonstrate the data (Zamawe, 2015; Braun & Clarke, 2006). The reviewing of themes was checked in reference to the nodes to concur whether they represented the vital elements of the data. At this stage, an analysis of the data was guided by the emerging themes. As the coding of the transcripts progressed, inductive nodes were allocated to sections of the data that defined a new emerging theme (Boyatzis, 1998). The added nodes were separate from the initial determined nodes and some expanded on the predetermined nodes (Appendix H). The linking of nodes can be described as a process of finding themes or patterns from the available data (Fereday & Muir-Cochrane, 2006). Themes from the data also began to group as participants began to develop a consensus of similarities and dissimilarities to the questions asked in the discussion. Differences in the answering to the questions were also noticed in relation to the years of clinical experience of the participants.

7. The final stages of the data analysis included the grouping of the possible themes that were identified from the developed codes (Braun & Clarke, 2006). Upon triangulation and peer debriefing with the supervisors of the research study to ensure trustworthiness and rigour of the data analysis process, it was decided that the emerging themes should be reduced based on the objectives of the study (Appendix I). The emerging themes that are influenced by the objectives of the study were further reduced to five core themes that represented the interaction between the data, the codes, the nodes, and sub-nodes.

8. The interpretive phase of the study connected the five core themes to drawn and verified conclusions or explanations, that were consistent with verbatim responses or phrases from participants. They represented particular themes and captured the discussion feedback as described authentically from the transcripts or raw data (Appendix J) (Miles & Huberman, 1994). The themes were repeatedly checked by the researcher and supervisors to ensure that they represented the raw data accurately (Nowell et al., 2017; Willig, 2013). This allowed for further credibility, trustworthiness, and rigour to the study. The results and discussion of the study was reported using verbatim responses of participants from the transcripts, summaries, and literature to represent the participant's insights (Nowell et al., 2017).

1.6.12 Data Quality

1.6.12.1 Reliability and trustworthiness

In qualitative research, the core of reliability refers to consistency (Carcary, 2009; Grossoehme, 2014). As data is analysed from the source e.g. from the recordings of focus group discussions with participants, the researcher is meant to validate the accuracy of the information gathered by continuous evaluation of the context as well as the form (George & Apter, 2004). In this study triangulation first occurred with a peer debrief with Ms Samantha Campbell, a co-facilitator in the study (Patton, 1999). After that further triangulation was provided by the supervisors of the study This ensured reliability and trustworthiness within this study.

1.6.12.2 Accuracy

Accuracy in a study refers to the language that is utilised during the data collection process. The research discussions with participants were conducted in English. There was no need for a translator, as all participants were able to understand and converse well in the English language. The co-facilitator of the research discussions is an occupational therapist who is familiar with the study design. She was able to provide further clarity in terms of prompting participants further during the discussions as she understood the research design well.

1.6.12.3 Accuracy and transparency of the research tools

The quality and credibility of a study are referred to as transparency (Teddlie & Tashakkori, 2009). In this study, transparency was ensured when the researcher shared information about the purpose of the study with participants in the informed consent form, the invite to participate both electronically and telephonically and during the introduction of the research discussion. Questions were structured to be easily understandable and were relative to the research design. The questions allowed for free discussion amongst participants and further explanation and prompting of the questions was done by the researcher and co-facilitator to ensure accuracy and transparency. They were also informed at the end of the discussion of how the data analysed from the discussions may inform other research in the future.

1.6.12.4 Credibility

Credibility in qualitative research outlines the main components of a research study, placing a focus on how the researcher undertook data collection and how the data received, was analysed to identify relevant themes and ideas (Graneheim & Lundman, 2004). Credibility as a critical element is improved through the selection of participants that have experience in the topic being investigated, which enhances the quality of the data from the discussions (Graneheim & Lundman, 2004). In reference to

this study, participants that were selected had to have two or more years of experience working in the public health sector as an occupational therapist providing intervention to high- risk infants. Competence in therapy can be described as working in a particular field of practice for two years or more, as well as being able to adapt intervention strategies to the specific needs of the client and their context (Unsworth, 2001).

The research design that is used for the collection of data has a significant role in the credibility of the study (Graneheim & Lundman, 2004). Focus groups were carried out through the online platform ZOOM and were audio recorded via the platform to capture the verbatim responses of the participants experiences in the care of the high-risk infant (Pietkiewicz & Smith, 2012). Participants felt comfortable to participate in the research discussions as most were already familiar with each other due to the limited number of permanent therapists in the province. Aspects such as confidentiality and participating voluntarily was discussed through informed consent. There is no set structure in place on the quantity of data that is to be collected, however, the quality of the data needs to be adequate and appropriate in order to address the research questions (Graneheim & Lundman, 2004). Identifying appropriate themes, sourcing the relevant information from the data and making sure that all data received is used efficiently provides credibility to the research study (Braun & Clarke, 2006; Graneheim & Lundman, 2004).

A pilot study was conducted prior to the focus group discussion to allow the researcher to practice the questions and gain insight into the use of the data collection instrument tool and to become aware of any difficulties that may occur. Credibility is also assisted by a methodical analysis of the data that ensures that valuable information has not been omitted but rather has provided input inclusively to the results of the study. The researcher had face to face and online ZOOM meetings with the co-facilitator and supervisors of the study through the finalising of the interview schedule and data analysis to ensure accurate interpretation of the findings.

1.6.12.5 Dependability

Dependability in research refers to how the raw data evolves during the process of being studied and analysed and whether the findings of the study appear to be reasonable (Graneheim & Lundman, 2004; Pitney, 2004). The questions in the development of the instrument were guided by the conceptual framework together with evidence from the literature to aid the discussion format. Further probing and prompting were also utilised to expand on questions asked to the participants. Triangulation of the data collection and analysis process was discussed and shared with the research team to explore different perspectives and biases. This allowed for information to be validated.

1.6.12.6 Confirmability

Confirmability refers to the impartiality of the researcher throughout the study, in order to remain unbiased by their personal experiences and emotions (Anney, 2014). Reflection and triangulation are crucial in the research process to ensure confirmability. The researcher's positionality needed to be taken into account from the initiation of the study, as it may have had an impact on the findings (Willig, 2013). The presumptions, personal beliefs, opinions and biases of the researcher was recorded via a reflective statement to acknowledge the thoughts and views in the background of the study (Appendix K). This was important to document as the researcher may have had an insider bias, being employed in the KZN public health sector, having additional training in neonates and working with this population daily. Being aware of the personal experiences that could have influenced the study assisted in preventing bias (Willig, 2013). Reviewing through the data analysis process and the findings of the study to ensure confirmability was done by supervisors to ensure that interpretations were fair and just (Anney, 2014).

1.6.12.7 Transferability

Transferability can be described as how the results or findings of the study can be applied to an alternate sample group in another context (Graneheim & Lundman, 2004). This aspect may not be applicable in this study as the training, skills and knowledge of occupational therapists in the South African context may differ compared to therapists who have graduated in other countries. The experiences, ideas and opinions of therapists in KZN may also differ compared to other provinces in South Africa. This can be considered as a limitation in this study.

1.6.13 Ethical Considerations

Ethical clearance was issued by the University of KwaZulu-Natal (UKZN Biomedical Research Ethics Committee (BREC/00001886/2020). The larger KT study has clearance from UKZN (HSS/1213/016); and the DOH Health Research and Knowledge Management Directorate (NHRD Ref. KZ_202008_066) (Appendix L and M).

1.6.13.1 Confidentiality

Participants were advised telephonically that they had to enter their names, initials or a pseudonym when entering the ZOOM online platform and that their usernames would be visible to other participants. Voices could not be anonymised. It was not mandatory for participants to put on their videos; if they were comfortable in doing so, it was welcomed by the researcher. In written outputs, pseudonyms. Informed consent was given by all participants to contribute to the discussion and for it to be recorded using the built-in ZOOM recording function. ZOOM guidelines were provided to

participants prior to the research discussions (appendix D). In written outputs, pseudonyms were provided to the names of each participant to ensure anonymity and confidentiality. Data received from participants through the discussions was stored confidentially as documented in the data management section of this study.

1.6.13.2 Autonomy

The researcher informed participants that they may withdraw from participating in the study at any time. They were also informed that by withdrawing they will not render a risk or expose themselves in any way. Participants were given the opportunity to make an informed decision and volunteer their contributions in the focus group discussions.

1.6.13.3 Informed consent process

Consenting participants were informed of the focus group discussion procedure as well as the allocated time of the discussions telephonically. Participants that agreed to participate in the discussion were sent informed consent sheets via email (Lobe et al., 2020). The replying to the email with a completed form was acknowledged as receiving informed consent from the participant (Lobe, 2017). The discussion took place in English, as all participants were able to comprehend and converse in the English language. Verbal informed consent was received from all participants prior to the discussions commencing and are recorded on the discussion audios and transcripts. Participants were informed in the introduction of the discussion groups that participation was voluntary and that if they felt to withdraw their participation, it would be accepted and that it would not jeopardise the study in any way. Participants were informed that confidentiality in terms of their personal details and participation in the discussion was ensured and would be maintained throughout the study (Escobedo, Guerrero, Lujan, Ramirez, & Serrano, 2007).

1.6.13.4 Obtaining a good researcher-participant rapport

The researcher is considered an insider in this study as she is employed in the public health sector of KZN and has built a professional rapport with some of the participants. Rapport was built with other participants through personalised phone calls when inviting them to contribute to the research discussions. Being an insider allowed for accessibility to participants, as all therapist contact details are distributed via the OT Forum in accordance with the POPI Act 2013. Therapist details are shared amongst all full-time therapists in the province of KZN to improve referral pathways and mentorship programmes for junior therapists. As an insider in the study, there was a shared and improved understanding of the research problem and question (Costley, 2010). The researcher's positionality can be described as an “insider into practice”, as the findings of this study will be able to inform

academics about the perceptions, beliefs, views, and opinions of occupational therapists employed in the public sector to bring about change (Herr, 2005). Insider bias was prevented by peer debriefing and continued triangulation of the findings by the co-facilitator of the discussion and supervisors of the study to ensure validity and trustworthiness (Costley, 2010, Herr, 2005). Furthermore, a self-reflective annotation (Appendix J) was kept by the researcher acknowledging being an insider.

1.6.13.5 Beneficence

Beneficence can be described as prioritising the interests and benefits of the participants of the study whilst minimising the risks to the participants (Murphy, 1993). Beneficence also relates to increasing the benefits to humanity as a whole (Israel & Hay, 2006). By contributing to the discussions, participants are assisting the researcher in exploring and gaining insight on the use of the KT process in the public health sector as well as to receive data on the current care of the high-risk infant in the public health sector of KZN. Therefore, contributing in the study is not placing participants at risk, as they are assisting in providing valuable input to new literature in the field of OT practice in neonatal intervention in the KZN public health context (Israel & Hay, 2006; Murphy, 1993).

1.6.13.6 Non-maleficence

Non-maleficence is a term used in ethics which refers to causing no harm or uneasiness to those participating in the study (Gillon, 1985; Israel & Hay, 2006). Participants were informed that they could terminate their participation in the study at any time without jeopardising the study. Participants were also not forced to respond to questions asked during the discussions and were able to make their own decisions on whether they would like to contribute to the question being invited to the group.

1.6.13.7 Justice

Implementing justice in research ensures that participants are chosen according to the needs of the study rather than convenience, therefore all participants should be given equal and fair opportunities (Israel & Hay, 2006). Participants in this study were treated justly and were not forced to participate, they agreed to contribute to the discussion at their own will. Pseudonyms were allocated to participants from the discussions to ensure confidentiality and anonymity when reporting on results.

1.6.13.8 Benefit and Risk

The benefits from a study must overshadow the possible risks (Israel & Hay, 2006). This study did not have risks involved as participants answered questions according to their views, opinions, ideas, and experiences as clinicians. They contributed to the discussion when they felt that they had information to share about the question being asked. The topic of discussion was not sensitive. The

benefit of procuring valued findings from the data collected is of an advantage to the research study as well as to the profession of OT in neonatal intervention. Misrepresentation of the questions or of a participant answers during the discussions were acknowledged and rephrased by the researcher and co-facilitator to ensure accuracy so that findings would not be misinterpreted during the analysis.

1.6.14 Conclusion

This chapter focused on the methodology of the study being that of a qualitative approach using the conceptual framework as a guide to the instrument design. Participants in this study consisted of occupational therapists employed full time with two or more years of clinical experience in the public health sector and who provided intervention to neonates and high-risk infants. A reflective statement by the researcher prevented insider bias, and triangulation of the qualitative data using thematic analysis, peer debriefing by a co-facilitator, and supervisors to ensure validity and trustworthiness of the research outcome. Ethical considerations were observed throughout the data collection procedure to conform to good practice as a researcher.

CHAPTER 2: MANUSCRIPT

INTEGRATING KNOWLEDGE TO PRACTICE FOR OCCUPATIONAL THERAPISTS WORKING WITH HIGH-RISK INFANTS IN THE KWAZULU-NATAL PUBLIC HEALTH SECTOR: A QUALITATIVE EXPLORATIVE INQUIRY

SUMMARY

Neonates are a vulnerable population due to their increased risks of mortality and morbidity. Occupational therapists employed in the public health sector of KZN play a vital role in implementing NDSC for high-risk infants during their admission in the Neonatal Intensive Care Unit (NICU). To the best knowledge of the researcher, there is limited literature available within the South African context in the use of evidence-based practices, and the integration of knowledge translation (KT) amongst occupational therapists in the therapeutic management of the high-risk infant. Five themes emerged in this study. Therapists outlined the facilitators, inhibitors, referral pathways and their personal interests in OT neonatal care. Supportive management and MDT were highlighted as facilitators in the hospital environment whilst OT staff shortages, insufficient undergraduate training in the field and a lack of funding for courses for post graduate OT training were regarded as inhibitors to practice. OTs source and synthesise knowledge from multiple sources to integrate, utilise and translate into neonatal practice. Contextual barriers are identified in various levelled facilities with acquired neonatal knowledge being adapted by therapists for low resourced settings. Findings have identified various knowledge-to-practice gaps for OTs who support neonates in low resourced settings. Therapeutic resources and funding for postgraduate training, an improvement in the undergraduate curriculum, and policy development appear to be necessary to inform a standard of care across the province.

JOURNAL

The ***Scandinavian Journal of Occupational Therapy*** is a well-renowned journal, recognised internationally. The journal acts as a global platform that publishes research in the field of occupational therapy and occupational science. It is open to articles from individuals and groups from various contexts and all levels of society.

STATUS OF THE PUBLICATION

In Review

The manuscript follows the author guidelines for the journal.

ORIGINAL RESEARCH

Integrating knowledge to practice for occupational therapists working with high-risk infants in the KwaZulu-Natal Public Health Sector: A Qualitative Explorative Inquiry

ABSTRACT

Introduction: Occupational therapists (OTs) have a vital role in neurodevelopmental supportive care (NDSC) for high-risk infants during their admission in the Neonatal Intensive Care Unit (NICU). To the best knowledge of the authors, no published research has been reported on the integrated knowledge translation amongst OTs working with high-risk infants in the public health sector of South Africa.

Aim: This study explored the knowledge to practice gaps of OTs who provide supportive care to high-risk infants.

Methods: This qualitative study used non-probability sampling to recruit 17 OTs who are employed in the public health sector in six districts of one province of South Africa (SA). Data were collected via virtual focus group discussions. Data were thematically analysed using a hybrid approach of inductive deductive reasoning.

Findings: The study identified five themes which included OT and neonatal care in the public health sector, Knowledge Acquisition and Knowledge Synthesis, Knowledge Translation/Utilization, Contextual barriers/adaptation, and the ideal OT in the ideal neonatal setting. Facilitators, inhibitors, referrals, and interest in OT neonatal care was highlighted, namely supportive management and multidisciplinary team (MDT), staff shortages, insufficient undergraduate training in the field and a lack of funding for courses. OTs source and synthesise knowledge from multiple sources to integrate, utilise and translate into practice. Contextual barriers are identified in various levelled facilities with acquired neonatal knowledge being adapted to specific contextual needs. Participants envision the ideal day and OT to support neonates in the public health setting.

Conclusions: The findings show that the knowledge to practice gaps for OTs includes insufficient training, a decreased interest in neonatal care, severe staff shortages, frequent multidisciplinary team rotations and a reduced understanding of the OT role in the NICU. Resources, training, and policy development appear to be necessary to inform a standard of care.

Keywords: Occupational therapy, knowledge translation, evidence-based practice, high-risk infant, neonates.

INTRODUCTION

Goal three of the Sustainable Development Goals (SDG) aims to decrease neonatal mortality rates by 1.2% in 1000 births, and to reduce mortality in children below the age of five years before and until the year 2030 (UNICEF, 2018). Whereas child mortality rates have proven to have shown a decline over the past 20 years, there is a need to emphasise child morbidity. The results of preterm birth complications and other neonatal risk factors at birth, may lead to neurological injury that can result in long term cognitive, sensory, and motor impairments in infants (Aylward, 2014a; McCormick et al., 2011; Mwaniki et al., 2012). There is a shortage in the literature available on the rates of morbidity and the results of impairment or disability following neurological insults post preterm and full-term births in LMIC as compared to high-income countries, although 98% of neonatal morbidity occurs in underprivileged countries (Lawn et al., 2010; Mwaniki et al., 2012). Morbidity is part of the occupational therapy (OT) scope of practice; it is therefore essential that early recognition of neurodevelopmental disorders and the care of the developing brain through NDSC is implemented in NICUs and high care units so that the severity of morbidity may be reduced.

Rehabilitation therapists are expected to use clinical reasoning with careful, thoughtful and clear use of studying evidence-based practices (EBP) so that they can make knowledgeable choices that influence the treatment of their client's (Menon et al., 2009). Being able to recognise this gap has encouraged great interest in knowledge translation (KT), as KT allows for the giving, taking, and integration of concrete and practical applications within multifaceted organisations; therefore to bridge the gap between knowledge and practice it is integral that clinicians must be able to recognize which interventions are relevant in driving knowledge attainment in all clinical areas (Menon et al., 2009). A scoping review discovered that there had been limited studies indicating the benefits and results of KT strategies, as well as decreased practical research on how to integrate KT (Gagliardi & Dobrow, 2016). A study by Jacobs 2018, utilised implementation research to investigate the current practices of NDSC amongst the multidisciplinary team (MDT) who service the NICU in two public hospitals in the province of Gauteng South Africa (Jacobs et al., 2018). A study by Hardy et al. 2020, investigated the experiences of community service OTs working in the NICU in KZN, SA (Hardy et al., 2020). Anecdotal evidence has identified a gap within the SA context in determining how permanently employed OTs working in the NICU/High care units integrate their clinical experiences with EBP in the care of the high-risk infant. It is known that there is also a lack of research utilisation of EBP by

OTs who work in the NICU in the SA public health sector, with many therapists utilising various sources that may not be evidence-based or are outdated (Hardy et al., 2020). The exploration and use of KT in developing and determining the skills of OTs in utilising EBP have been identified in previous studies in developed countries (Thomas & Law, 2013). However, to the best knowledge of the authors, it has not been explored with only permanently employed OTs who support high-risk infants in the public health sector of KZN SA.

The OT working in the NICU is required to have expert training in NDSC in order to be able to plan inclusive intervention, evaluation and discharge planning of the neonate, providing education to staff and families, as well as making fast, efficient and effective decisions (Craig & Smith, 2020; Hockenberry & Wilson, 2018; Nightlinger, 2011; Royal College of Occupational Therapists, 2017). A recent study has discovered that OT found it challenging to establish their roles within the NICU; therapists felt that they did not have the adequate skills and knowledge to work in the stressful NICU environment (Hardy et al., 2020). The hardships experienced in the public health sector, especially with the high infant and child mortality and morbidity rates are an indication of the need to translate EBP into practice (Hoque et al., 2011; Sherry, 2014). Therefore, the current clinical standards of care must be determined before EBP can be applied (Robinson, 2000). This study is aimed at discovering the current knowledge to practice gaps and visualising the ideal knowledge to practice interventions for OTs. They support high-risk infants by exploring the perceptions of OTs working in neonatal care in the public health sector of KZN.

STUDY DESIGN

This study is reported according to the Consolidated Criteria for Reporting Qualitative Research (COREQ) (Tong, Sainsbury, & Craig, 2007).

THEORETICAL FRAMEWORK

Methodological orientation and theory

The study aimed to describe the experiences of the focus group (permanently employed OTs in the public health sector of KZN) who share similar ethnography or characteristics. The design focused on the narrative whilst still allowing the researcher to gain insight and explore discussions further with participants [18,19]. A combined theoretical framework was developed using the Appreciative Inquiry (AI) approach and KT process, to orientate the qualitative exploratory research design. The aims, objectives, data procedure and data analysis of the study were guided by the framework.

The AI approach is described as focusing on “asking the unconditional positive question to ignite transformative dialogue and action within human systems” (Ludema et al., 2006). AI is encompassed of four phases. The phases include discovery, dream, design, and destiny. The first two phases of the AI approach were used to develop and direct the presentation style of the data collection instrument. The inner circle of the diagram in figure 1, shows the discovery phase, which was used to pursue, explore, and highlight aspects that motivate organisations, despite the difficulties and barriers that OTs may encounter.

The AI approach does not place importance on the negative factors to find solutions; rather it will investigate what is working and emphasise this to motivate people to accomplish their goals. Using concepts of the discovery and dream aspects of the AI approach, assisted in maintaining open-ended questions and encouraged dynamic discussions amongst participants in the focus groups. The content of the data collection tool was designed to understand the KT process amongst OTs. Questions aligned with the principles of KT such as knowledge enquiry, knowledge synthesis, sustaining knowledge and knowledge utilization in the care of the high-risk infant [17]

This promoted a discussion amongst OTs about how they enquire knowledge to intervene in the NICU/high care units and support the high-risk infant, as well as how they synthesise and sustain the information that they source, utilise and adapt this knowledge to their contextual needs. The outer circle of the conceptual framework being dream allowed for OTs to envision, who the ideal therapist for the NICU should be, what is the ideal to share and sustain knowledge amongst therapists who work in neonatal care, what would an ideal toolbox for the NICU consist of, as well as what an ideal day in the NICU should look like for the OT. The framework using the discovery and dream phases of the AI approach stimulates curiosity and encourages learning for larger group change; therefore, the core of the organisation that is built on positive potential and wisdom brings hope for the possibility of change in the future [18].

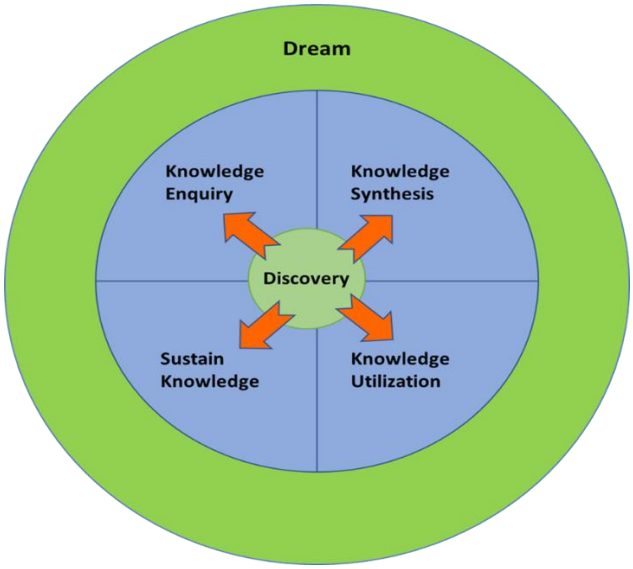


Figure 1: *Theoretical framework and methodological orientation of the study*

PARTICIPANT SELECTION

Sampling

Participants included in the discussion groups were selected using purposive nonprobability sampling and met the selection criteria of the study [17]. The specific criteria included participants who were permanently employed for more than two years as OTs, who worked with neonates and high-risk infants in various levels of care in public health institutions across the province of KZN SA.

Method of approach

Participants were sent an invite with information about the study via email. They were also invited telephonically by the researcher using contact details provided by provincial OT forum. A list of personal contact details was drafted by the forum will full consent from all therapists for details to be shared amongst other therapists in the province for the purpose of forming sound referral pathways and a mentorship programme for junior therapists. The sharing of personal information complies with the Protection of Personal Information (POPI) Act of 2013 and. The sharing Informed consent and demographic information forms were sent to interested participants to fill prior to the focus group. Participants were informed that partaking in the study was voluntary and that the information received would be treated with confidentiality. Each focus group lasted 1.5 hours on the electronic platform ZOOM.

Sample size

Total population sampling was 46 OTs however seventeen participants (n=17) took part in the focus groups.

Non- participation

Two therapists declined to participate as they preferred to work in other rehabilitative area and left the scope of paediatrics to their colleagues. Two different therapists who agreed to join the discussion were unable to participate on the day due to personal reasons and poor internet connectivity.

SETTING

Setting of data collection

Upon the SA government's decision to initiate a nationwide lockdown due to the Corona Virus (COVID19) pandemic globally, there became a need for researchers to explore alternate methods for qualitative data collection due to social distancing guidelines [17]. Two discussion focus groups via the online platform ZOOM were used as a method of data collection in this study. Participants represented six of the ten Districts in the province of KZN, SA. There was no other presence involved in data collection besides that of the researcher, co-facilitator of the research discussion and participants.

Twelve out of seventeen participants completed their undergraduate training at the same institution. The demographic profiling of participants can be found in the table below.

Table 2: *Demographic profile of occupational therapists (n=17)*

Demographic Variable		**Occupational therapists n (%)**	
Gender	Male	1	6%
	Female	16	94%
Work Experience	2-5 years	5	29%
	5-10 years	7	41%
	10-15 years	2	12%
	<15 years	3	18%
Level of practice setting	District	10	59%
	Regional	4	24%

	Tertiary	3	18%
Prior training in neonatal care	Yes	11	65%
	No	6	35%

DATA COLLECTION

The initial questions for the discussion schedule were developed by the authors and reviewed and further refined with a team working on research in the field of knowledge translation and neonatal care. The questions were refined within a theoretical framework to focus on OTs that worked with high-risk infants supported by evidence found in the literature and clinical experiences of the author, co-facilitator, and supervisors. The questions in the instrument were relative to the research question, aim and objectives of the study which emphasized "knowledge to practice gaps" and "ideal knowledge to practice interventions" with OTs in the public health sector of KZN. The method in which the questions were phrased as well as expected outcomes and prompting by the author and the co-facilitator was recorded on a chart and later onto a word document. This allowed for further questioning, prompting and guidance with participants during the focus group.

A pilot focus group was simulated on ZOOM with two community service OTs (CSO) and the co-author of the study. The pilot allowed for the asking of the set questions from the data collection instrument. From this, problems identified in the presentation style of the questions and in the way that the discussions would be facilitated were acknowledged by the author. The primary issue identified was that of internet connectivity and the background noise from the participant's video calls.

Table 3: Sample and Data Collection Method

- Focus group discussions via electronic platform ZOOM.
- Audio recorded via ZOOM.
- Two focus groups with n=17 participants of a duration of 1.5 hours each.
- Facilitation of the groups conducted by the author as facilitator and co facilitator acting as a moderator in the session using a semi structured interview guide.
- No translation was required.

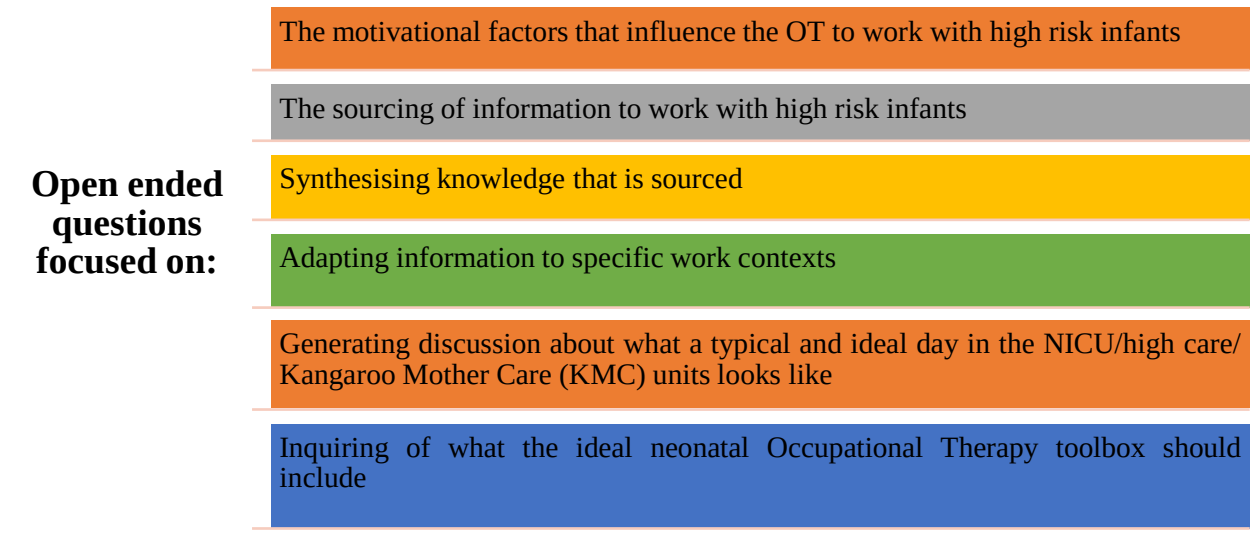


Figure 7 Open-ended questions in focus group

Discussions were recorded via the audio recorder available on ZOOM. Observational and reflective field notes were made after the focus group by the author. This assisted with a preliminary analysis of possible themes that could emerge from the data. Each focus group spanned 90 minutes. Data saturation was reached once no new themes could emerge from the data; therefore, further coding was not feasible (Guest, Bunce, & Johnson, 2006). Transcripts were returned to participants for comment or correction. No feedback was received for changes to be made. The facilitator of the groups and the moderator listened to the audio recordings prior to the transcripts being available. This authenticated the data received from the participants. Transcripts were also checked and rechecked against the audio recordings to ensure credibility (Creswell & Creswell, 2017).

ANALYSIS AND FINDINGS

Data Analysis

The transcribed data were imported into NVivo (version 12 Pro), to assist in the organisation of the data. The data were analysed separately and repeatedly to identify initial coding using thematic analysis (Braun & Clarke, 2006). Word trees were generated by the author on the software programme.

Derivation of themes

A hybrid approach that included a shared data-driven inductive deductive method was utilised to demonstrate rigour in the thematic analysis (Fereday & Muir-Cochrane, 2006). The coding process involved the reduction of data into initial themes. These were later categorised into themes and sub-themes (16 codes and 7 subcodes), and the relevant verbatim responses were highlighted to support

the findings. The final stages of the data analysis included the grouping of the possible themes and sub-themes that were identified from the initial coding (Braun & Clarke, 2006). Emergent themes were reduced to five core themes based on the objectives of the study.

Ethical Considerations

Ethical clearance was issued by the University of KwaZulu-Natal Biomedical Research Ethics Committee **(BREC/00001886/2020)** and the DOH Health Research and Knowledge Management Directorate **(NHRD Ref. KZ_202008_066**). An amendment has been submitted for this study (00005138), due to the current lockdown regulations relating to the COVID-19 pandemic preventing face-to-face contact for research discussions and focus groups.

Trustworthiness, reliability, credibility, and dependability

Triangulation can be described as making use of numerous sources of data, models, and methodology to provide valuable information to a study (Creswell & Creswell, 2017; Graham, 2005; Heale & Forbes, 2013). Triangulation was conducted by peer debriefing the coded data from the transcripts and eventually the emergent themes with the co-author and supervisors of the research study to ensure dependability, reliability trustworthiness, and to counter researcher insider bias. This also allowed for the data to be validated. Participants with different years of experience were selected via non-probability sampling to add value to the study. Credibility was ensured by the views of the participants being accurately interpreted from the audio recordings. Dependability was confirmed by keeping thorough records of the entire data collection and analysis process.

REPORTING

Results

Five core themes with relevant sub-themes emerged from the data. The verbatim responses of the participants are reported in each theme.

Table 4: Summary of Themes and Subthemes

OT and Neonatal Care in the Public Health Sector
• Inhibitors in working with high risk infants • Facilitators in working with high risk infants • Interest in paediatrics and neonatal OT practice • Referral system to OT as part of the facility's paediatric protocol and policy
Knowledge Acquisition and Knowledge Synthesis
• Acquiring knowledge from the multidisciplinary team (Doctors, nurses, rehab team) • Sourcing information to support OT neonatal practice • Acquiring information, knowledge and skills from multiple sources (Colleagues) • Acquiring information, knowledge and skills from multiple sources (Courses, workshops) • Acquiring information, knowledge and skills from multiple sources (Internet and journals) • Synthesising knowledge to work in OT neonatal practice • Acquiring knowledge from policies and protocols
Knowledge Translation/Utilisation
• Ethical practice in the NICU • Inhibitors and facilitators in sustaining knowledge • Sustaining knowledge through the family unit • Sustaining knowledge through community healthworkers.
Contextual Barriers and Adaptation
• Adapting to the contextual needs of the facility and community • Poor Referrals from the MDT • Typical day in the NICU, high care and KMC units • The infant and parent dyad
The Ideal OT and Neonatal Setting
• The ideal occupational therapist in neonatal practice. • The ideal day for OT practice in the NICU. • The ideal toolbox for the OT in neonatal practice.

THEME 1: OT and neonatal care in the public health sector

Facilitators in working with high-risk infants

Participants believe that the doctors that work in paediatrics at their facilities acknowledge the role and benefit of OT intervention in paediatrics, Early Childhood Intervention (ECI) and in neonatal care. They perceive the management of some facilities as being a facilitator in supporting the OT role in providing intervention to high-risk infants. The facility management is also supportive of follow up programs once the infant and mother are discharged. This allows for management to identify the implementation of OT programs and increases recognition of the OT role in ECI.

'*An enabler is definitely your management where you show how well your program can run and if you feed from one program into the next program and you're getting early childhood disability on top of it then that's an enabling factor.'* ***(OT1)***

Inhibitors in working with high-risk infants

Participants perceive the facility that employs them as a common inhibitor in providing quality interventions to high-risk infants, as they do not fund training for therapists to improve and expand on their knowledge and skills. Paying for training on a personal capacity is not always affordable, as courses and workshops are costly.

'Money is the big disabler, the fact that they don't fund training.' ***(OT1).***

Once an infant is discharged, the parent does not always comply with their follow up appointment dates with the high-risk baby clinic programs at the facility. Follow up appointments usually monitor the medical, feeding and overall development of the infant up to 2-3 years of age – this varies at different facilities. Participants identified that it is a difficult process to locate patients who default when the program is extensive, there are time limitations and poor OT staffing at most public health facilities in KZN. Staffing numbers in rehabilitation have decreased since the moratorium placed on posts in the KZN public health sector in the year 2016. This has led to many smaller departments being managed solely by junior therapists, whilst other departments in more resourced facilities struggle to provide full-time OT services in wards that require the assistance consistently. Participants describe an inhibitor as not having adequate staffing to have an OT providing full-time services in the NICU.

'Some of our disablers is that we don't have enough staff to be able to work in neonatal ICU and ideally we'd have an OT working full time there.' ***(OT4)***

Furthermore, participants believe that they were not provided with enough knowledge and skills to work with high-risk infants during their undergraduate training. Therapists self-learnt skills and appropriate interventions to support high-risk infants through their daily clinical experiences.

'I think one of the barriers we have as new therapists, we weren't really trained in neonatal care on campus and you go into this new hospital and you have to learn as you go along.' ***(OT2)***

Interest in paediatrics and neonatal OT practice

Once therapists are placed at various facilities to complete their community service, they are likely required to provide intervention to paediatrics in all spheres. OTs who work in paediatrics generally have or develop an interest and passion for working with infants and children.

'*Initially it was that I never had any exposure to working with neonates as a student or during varsity but once I did comm serve and started working in the department of health, obviously we got referrals for babies from the nursery and neonatal ICU and I'm really interested in it.'* ***(OT5).***

Further training, courses, and workshops focusing on ECI and neonatal care increases interest in the field, as OTs feel more confident and equipped to provide therapy to high-risk infants or children. Participants interest in neonatal care is sustained by clinical experience, being able to monitor infant development if ECI is initiated, in comparison to an infant who had not received any intervention at all and therefore had poor functional outcomes.

'it's been a combination of seeing the outcomes later in life and just knowing if you worked backwards, they could've introduced access care a lot earlier in the system and then through experience having worked with them early on and seeing the impact that an intervention can make reinforced for me why it is so essential to get into that field and the importance of early intervention.' ***(OT7)***

Referral system to OT as part of the facility's paediatric protocol and policy

Most health facilities in KZN develop independent standard operating procedures (SOP) with regards to paediatric referral protocols and policies to other disciplines. OTs at some facilities only assess and provide intervention to patients when they are referred by the MDT. Participants do not blanket cover wards due to inadequate staffing, and compliance with the SOP of the facility. Some participants indicated that it is not a choice of interest for them to work with high-risk infants. They provide assessment and intervention in the NICU, only upon referrals received from the doctors

'I don't think we're drawn to do it; I think it's a matter of the referrals that we get from the doctors and then we just do the treatment as per requirements or as we see necessary.' ***(OT8)***

THEME 2: Knowledge Acquisition and Knowledge Synthesis

Acquiring knowledge from the multidisciplinary team

Participants acquire knowledge to support the high-risk infant through doctors, specialist paediatricians, neonatologists and nurses to assist in developing integrated intervention strategies to help the high-risk infant and parent. Healthy relationships are formed between clinicians with knowledge brokerage being implemented as they learn and share the expertise of their roles in support of the infant and the family. Participants view the nursing staff in the NICU, as an essential role player in understanding the OT scope of practice in the care of the high-risk infant. Therapists generally rely on nursing staff in reminding doctors to refer to OT. MDT ward rounds in the NICU, also promote

knowledge brokerage amongst the various disciplines. The MDT have internal communication channels, where they share information or refer patients to each other.

'The other source comes to think of it is colleagues, we have had the most amazing paediatricians and neonatologists that we got to work with, both South African and international and having that shared sort of think tank where you're working with a dietician, in combination with a paediatrician, with a neonatologist and an OT, and you're getting all together and you're starting to think about intervention strategies and everyone starts sharing expertise from their fields, we developed a strong multi-disciplinary team and we got to learn from each other which was great.' ***(OT7)***

Sourcing information to support OT neonatal practice

Participants make use of the infant's clinic book (Road to Health booklet) to educate parents on the developmental milestones that the infant should achieve. The book contains simple illustrations. This makes it user friendly to mothers that are literate or illiterate.

'The patient road to health card, road to health booklet gives us a lot on the developmental milestones.' ***(OT11)***

Participants use the information provided in the paediatric assessment forms during the infant's admission. This assists in understanding the infant from a medical and rehabilitation point of view as information is sourced from an MDT perspective. Besides sourcing information from the infant's admission records and booklets, information is sourced through interviews with the family. Comprehensive referral forms that OT departments in various facilities have individually created, also assist in gathering information about the infant from the treating doctor.

'We source our info from just being able to work in the NICU, from the patient record, so the patient file, the interview with the mom or dad or the parents, from the referral letter, we have a request for consult that the doctor has to fill.' ***(OT11)***

Acquiring information, knowledge and skills from multiple sources

Participants acquire information, knowledge and skills from textbooks that are available in their departments on neonates. Colleagues with experience was the main point that participants identified in developing knowledge and skills in the care of the high-risk infant and to guide them in making use of the correct information, advising on difficult cases and treatment modalities.

'*It's just having access to speak to colleagues that have more experience, so when I first started out obviously being able to speak to people that that had more experience in the NICU.'* ***(OT5).***

Participants also acquire information from policies that have been implemented from the KZN Department of Health (DOH). Within this comprehensive policy is a checklist that the nurses who work in the NICU complete. This assists in identifying and providing information on an infant that is or has the potential of being classified as high risk.

'With the new policy that's come into neonatal to try lower litigation against the department of health, there's that checklist that the nurses have to fill in and if you go through the checklist, a lot of the factors that we have had on our form are now also on that checklist. It is in our policy now and when I started there was no such thing as a neonatal check list, so there definitely are those guidelines to say if the baby isn't checking these boxes- that's a red baby, orange baby or a green baby." ***(0T1)***

The Little Steps course, which focuses on NDSC for premature infants is one of the most popular courses available in SA, which caters for the MDT who work with high-risk infants in the NICU. Participants identified this course to be helpful in increasing their confidence, knowledge and skills in working with high-risk infants and their families. The Little Steps course is not affordable to all therapists. Therefore, those who have attended the course provide in-service training to others so that they can translate the knowledge to staff in their own facilities on NDSC strategies to implement in the NICU.

'The Little Steps course which we haven't attended personally but have gotten in-service training from therapists that did it and the suggestions made for how you can work in the neonatal ICU were brilliant and we just took it back and in serviced it in our hospital and just said how can we ask the nursery to intervene.' ***(OT9)***

Academic supervisors from the University of KZN provide knowledge brokerage through offering workshops on working with high-risk infants to clinicians. Academic supervisors also educate students whilst they are at their clinical sites. This allows for clinicians to also observe and learn concurrently. Participants keep updated in the field of neonatology by acquiring and improving knowledge through engaging with scientific evidence from published articles in journals. They make use of online searching to improve their experience and understanding in classifying specific terminology used in the NICU and what factors would influence an infant's medical and functional prognosis once they are discharged.

'There's lots of really superb cutting-edge research coming out so accessing journal articles in the latest neonatal journals, there's also a lot of OT research coming out which is very exciting.' ***(0T7)***

Synthesising knowledge to work in OT neonatal practice

Participants who have 2-5 years of experience synthesise information that they have accessed from various sources and use it through trial and error in intervention with patients to observe what is useful and what is not**.** Participants believe that most of the knowledge and skills they develop or acquire are through their own clinical experiences and reasoning.

'I think it comes down to your clinical reasoning at the end of it, there's so much information out there, you wanna use your clinical reasoning in addition to the information you gather to provide the best possible treatment.' ***(OT9)***

THEME 3: Knowledge Translation/Utilization

The inhibitors and facilitators in sustaining knowledge

Participants attribute doctors in smaller facilities as inhibitors in sustaining knowledge in neonatal care. This is due to them rotating frequently, and not prioritising rehabilitation with high-risk infants. Therefore, they do not refer infants for therapy.

'From my experiences in district hospitals I find it more difficult to get buy in from medical staff. You know doctors are rotating the whole time and you're trying to play catch up and their doctor meetings are not- the focus on rehab and intervention is not as strong.' ***(OT7)***

Participants believe that putting OT in the medical in-service roster and providing consistent in-service training to educate doctors and nurses on the OTs role in the care of the high-risk infant, on the OT referral process and what programmes are offered at the facility and on discharge, act as a facilitator in sustaining knowledge in facilities. In-service training may assist in them building a trusting relationship with the OT department and accepting OT as a valuable member of the MDT. Participants also believe that getting the medical manager on board may assist in sustaining knowledge transfer of the OTs role in the care of the high-risk infant amongst the paediatric medical team.

'*We did in-service training with our nurses on how to implement some of the care practices, we also did in-service training with every single intern-medical-intern that was coming through, so that everyone in the team is aware of how to implement your therapeutic approaches so it's not just therapy and it becomes the base standard the entire system runs on.'****(OT7)***

Participants believe that another facilitator in sustaining knowledge of the OT's role in neonatal intervention is using scientific evidence to prove to hospital management that OT interventions may assist the facility in decreasing expenses. Participants perceive the parent role in the NICU as being important in sustaining knowledge in the care of the high-risk infant. Participants educate the parent individually or in groups and adapt the intervention to the specific needs of the infant and parent dyad.

'So another thing that was done was a lot of work with the parents one-on-one as well as in groups and then seeing how you can adapt your care approach specifically to the parents' needs and how is that best going to achieve a dyadic approach in that moment, how best you're going to get the child and parent to work together.' ***(OT7)***

THEME 4: Contextual barriers and adaptation

Adapting to the contextual needs of the facility and community

Participants engage with their past and present knowledge and experiences and combine it with scientific evidence to develop and adapt intervention strategies to their specific context. Participants indicate that most research in the field of neonatology comes from first world countries and may not suit the SA context.

'You also need to consider the resources at your institution because a lot of the research that comes out is from first world countries, and we don't always have those kinds of resources. So, it's always nice to see what they are using and try to think out the box and how we can use a similar sort of idea to get the same result.' ***(OT9)***

Participants have developed language-appropriate education pamphlets for parents and caregivers at their facilities. Participants employed at tertiary institutions prioritise what information should be given to a parent or caregiver as they are not admitted for long periods of time. They believe that selecting the most applicable information to give to the parent comes with experience.

'Because we're tertiary and we not retaining these kids for a long period, kind of being able to prioritize what you hand over to the caregiver and that comes with a bit of practice as well because you want to help the mom as much as you can and give them as much but sometimes I find that less is more.' ***(OT6)***

Poor Referrals from the MDT

Participants indicate that although doctors rotate at the smaller hospitals every few months, some do not acknowledge or understand the OT role in neonatal care even if there is a continuous in-service training program.

'I think the doctors that we work with do rotate, but most of the time they are there for like 2/3 months, so depending on the doctors- some of the doctors don't really work close with rehab at all. You trying to inform them maybe that this is what OT does and this is how we can actually play a role they still for whatever reason generally don't refer.' ***(OT13)***

Typical day in the NICU, high care and KMC units

Participants describe an average day in the NICU as being busy, short and chaotic due to working around the sleep and wake states of the infant or the parent not always being present. Participants feel that the NICU and KMC environments are supportive, and there is continuous training amongst staff and parents daily, in the form of classes, groups and individual education.

'I think short and chaotic summarises it for me, you go in there and this baby is sleeping and the other one is deep quiet sleep, and you can't interact with that one and you move to the next one but mom is showering and then you're here and then you're there, so it often felt quite chaotic.' ***(OT7)***

'It is usually quite busy in the morning, but it is a nice environment for me to work in because the team is very supportive and there's a lot of training that goes on and it's constant.' ***(OT1)***

THEME 5: The ideal OT and neonatal setting

The ideal OT in neonatal practice

Participants believe that the ideal OT must be a confident person who is knowledgeable in the field of neonatal care. She must also have an assertive personality to be able to engage with the MDT to facilitate change. Participants also indicate that if the undergraduate training for working with high-risk infants was comprehensive, then OTs may feel more equipped to work in the NICU.

'I think if we had a richer training system that would contribute more into having decent therapists. I think the other thing is passionate therapist, someone who is interested in it; you don't want someone who is half-hearted in the NICU, it's very emotionally intense work, it's very draining work so I think you need someone with gentleness with an equal thick skin. I think someone who can work as well with your neonates as well as your parents, a lot of communication skills with your staff.' ***(OT7)***

Participants also describe the ideal OT as being patient, compassionate and educated in the field of neonatal care. They do not believe that a junior therapist should work in the NICU. Participants view work in the NICU as being a 'specialised" field of practice in OT, and the therapist working there should have adequate training and experience to make them feel confident.

'I think a very patient, compassionate and an educated person in that field. I don't think your comm serve is the person that should be in that space. The person must be trained, neonatal ICU in my view is a specialised field and I don't think that comm serves can actually work there because if you are starting, you need to first understand the environment you are working in.' ***(OT4)***

The ideal day for OT practice in the NICU

Participants describe the ideal day for an OT working in the NICU as having a good working relationship amongst the MDT, as well as having the time and flexibility to be able to structure your workday.

'I think the ideal day would include proper team connection, as well as just the time to be flexible and fluid in who you see and when.' ***(OT7)***

The ideal toolbox for the OT in neonatal practice

Participants envision the ideal toolbox to include protocols for OT working in the NICU, that are based on scientific evidence for various diagnoses. Participants think that it should consist of standardised SA assessment tools that applies to the context and population group of the country. They believe that the data from this assessment can be utilised to develop research within the South African context in OT and neonatal care. Participants would like the ideal toolbox to also have a room that would be allocated solely for family and parent counselling.

'I think what I would really like in the toolbox is a South African assessment that is sensitive to our population and we can really start using that to generate our own data and to stand our ground on an international level in terms of research.' ***(OT7)***

Participants indicate that it is difficult for them and other OTs who have not had further training in working with high-risk infants to identify what the ideal toolbox should consist off, as compared to therapists who have received additional training.

'I think it's quite hard for us who haven't had further training in high-risk babies, it's hard for us to say what would be ideal whereas a person who has had that training may have a lot of things they would think would be most beneficial to kids.' ***(OT9)***

DISCUSSION

The findings of this study have outlined the knowledge to practice gaps for OTs supporting high-risk infants in the KZN public health sector. Doctors working in paediatrics recognise the value of OT in ECI and in neonatal care in some hospitals. Hospital management acknowledges OT services once they can see the benefits of early developmental care, especially with cases of morbidity. Receiving support from management contributes to the successful implementation of NDSC, and may decrease the expenses of the facility through shorter admissions and fewer health complications (Butler, 2018; Lubbe, 2010). Research has identified that the early implementation of NDSC encourages the overall development of high-risk infants (Legendre et al., 2011; Wallin & Eriksson, 2009). It has also been recommended in several studies that high-risk infants be referred to OT to provide early intervention programmes to promote neurocognition, performance in areas of occupation, maternal mental health and family centred care as a means of sustaining knowledge and supporting the infant and parent dyad (Butler, 2018; Hwang, Chao, & Liu, 2013; Lekskulchai & Cole, 2001; Lubbe, 2010; Spittle, Orton, Anderson, Boyd, & Doyle, 2015). Inhibitors in working with neonates, such as the KZN DOH not funding training in neonatal care for OTs, and training being unaffordable for many therapists correlates to a previous study, in which junior therapists stated that attending neonatal courses was difficult as they were costly (Hardy et al., 2020). Permanent staff shortages in the KZN DOH within the OT profession inhibits consistent care of high-risk infants in the NICU, and places strain on therapists (Beyers, 2013; Hardy et al., 2020; Shung-King et al., 2019).

It was found that participants who work in paediatrics at their hospitals generally have an interest in working with children and neonates. Further training in neonatal care increases a therapist's confidence and interest in the field. Studies have found that therapists with little clinical experience, feel incompetent, have decreased self-confidence, engage in interventions with flawed clinical reasoning and face challenges with their level of skill and what is expected of them in the work environment (Hodgetts et al., 2007; Robertson, 2012). Participants outlined that seeing positive developmental outcomes with implementing early intervention encouraged an interest in neonatal care. Other participants had no interest in working with neonates but followed the referral process, SOP of their facilities and the OT scope of practice to intervene only as required. This is aligned with findings from a study in which OTs did not work in the NICU due to a lack of interest in neonatal care (Hardy et al., 2020).

Participants acquire information and knowledge from a range of professionals in the MDT. Working relationships are formed between disciplines with the implementation of knowledge brokerage to learn and share the expertise of individual roles in supporting the high-risk infant. Information is shared during in-service training, ward rounds and making use of internal communication channels. This is consistent with studies in which working in a MDT, has been highlighted as being beneficial to ensure consistency in the care of the neonate (Aita & Snider, 2003; Aucott et al., 2002; King et al., 2009; Lubbe, 2010; Müller et al., 2016; van Wyk & de Beer, 2017). Information to support the infant and parent was acquired through working in the NICU and from other sources such as referral forms, admission booklets, interviews with the parent and the South African DOH Road to Health booklet which consists of an immunisation schedule, developmental and growth monitoring as well as other health information for infants and young children. Participant's clinical knowledge and skills were acquired through textbooks, online searching, consulting with experienced colleagues, DOH nursing policies, journal articles, courses, and support from the University of KZN lecturers. A lack of DOH policies for the OT role and specific practice in neonatal care could be an area for future research; this may assist in providing a standard of care across the KZN province.

A scoping study outlined that experienced OTs used evidence-based practice (EBP) in clinical decision making, using online research, reading of relevant literature and increasing knowledge and skills by attending courses and workshops for professional development in fields of interest (Copley et al., 2010; Sharoff, 2011; Thomas & Law, 2013; Vachon, Durand, & LeBlanc, 2010). The 'Little Steps' course focusing on NDSC for preterm infants was identified as the most common course attended by OTs. This correlates to two other studies that have recognized the course to be useful in the operationalisation of NDSC amongst the MDT working in the NICU (Hardy et al., 2020; Lubbe, 2010). The synthetisation of acquired information, knowledge and skills was thought to be from a therapist's own clinical experiences and practice. Experience plays a vital role in increasing the self-confidence of an OT, together with integrating research into practice(Thomas & Law, 2013).

Frequent staff rotations and disinterest of doctors to refer infants to OT make it challenging to sustain neonatal services (Hardy et al., 2020). The focus on rehabilitation is not prioritised as medical concerns take precedence. Providing in-service training to the MDT on the OT role facilitates knowledge sustainment and optimizes NDSC practices (Lubbe, 2010). EBP guidelines for NDSC come from first world countries and are adapted by professionals to the SA context (Als, Lester, Tronick, & Brazelton, 1982; Lubbe, 2010; VandenBerg, 2007). Participants adapt international guidelines according to their resources and the population they service. This may assist in relaying information to caregivers and

suggesting intervention methods that are contextually appropriate. A typical day in the NICU was outlined by some participants as being a brief, chaotic but supportive MDT environment. The ideal OT to service the NICU needs to be trained, confident, compassionate, assertive, and motivated to encourage practice change amongst the MDT. Junior therapists are not recommended to work in the NICU due to their lack of training and experience. This correlates with findings from other studies (Butler, 2018; Hodgetts et al., 2007; Robertson, 2012). An ideal day in the NICU is having positive working relationships with the MDT, time, and flexibility to provide individualised infant and family centred care. Participants envision the ideal neonatal toolbox to consist of standardised SA assessment tools and EBP protocols specific to OT whilst others felt like they could not imagine what the ideal would be, as they received no further training in neonatal care. Further studies exploring the ideal OT, and NICU toolbox for SA neonatal care is necessary.

Methodological considerations and limitations

A hybrid approach using inductive and deductive methods was utilised. This approach to analysing the data complemented the instrument questions by allowing the principle of KT and OT in the care of the high-risk infant, to be fundamental in the method of deductive reasoning whilst still letting themes emerge from the data using inductive reasoning (Fereday & Muir-Cochrane, 2006). Documenting of evidence through this approach displayed credibility, validity and trustworthiness in the research method (Koch, 1994). The study was limited to one province in SA and only included OTs in the public health sector; therefore, the findings may not outline the perceptions of OTs in the country as a whole or on an international level. The qualitative design and small sample size may not represent the perceptions of all OTs. A response bias may have developed, as OTs who had no interest or little knowledge in supporting high-risk infants did not respond to the invite for participation.

CONCLUSION

The findings show that the knowledge to practice gaps for OTs employed in the public health sector of KZN, are insufficient training in neonatal care due to postgraduate courses being unaffordable and not receiving funding or training from the DOH to improve knowledge and skills. A decreased interest of some OTs to support high-risk infants may indicate a gap in practice. Severe staff shortages place strain on therapists as they are unable to provide consistent care in the NICU. Frequent doctor rotations, and a poor understanding of the OT role in neonatal care result in infants not being referred to OT. Resources, training of OTs, and SOPs relating specifically to the OT role in neonatal care in the public health sector appear to be necessary to inform a standard of care across the province of KZN.

REFERENCES

1. UNICEF. Nurturing care for early childhood development: a framework for helping children survive and thrive to transform health and human potential. World Health Organization, Geneva; 2018.

2. Aylward GP. Neurodevelopmental outcomes of infants born prematurely. Journal of Developmental & Behavioral Pediatrics. 2014;35(6):394-407.

3. Mwaniki MK, Atieno M, Lawn JE, et al. Long-term neurodevelopmental outcomes after intrauterine and neonatal insults: a systematic review. The Lancet. 2012;379(9814):445-452.

4. McCormick MC, Litt JS, Smith VC, et al. Prematurity: an overview and public health implications. Annual review of public health. 2011; 32:367-379.

5. Lawn JE, Kerber K, Enweronu-Laryea C, et al., editors. 3.6 million neonatal deaths—what is progressing and what is not? Seminars in perinatology; 2010: Elsevier.

6. Gagliardi AR, Dobrow MJ. Identifying the conditions needed for integrated knowledge translation (IKT) in health care organizations: qualitative interviews with researchers and research users. BMC health services research. 2016;16(1):256.

7. Jacobs L, Cateleijn D, Lubbe W. Neurodevelopmental supportive care in South African NICUs - an essential change of attitude. World Federation of Occupational Therapists (WFOT); George Western Cape, Johannesburg South Africa : University of the Witwatersrand,; 2018.

8. Hardy M, Govender P, Naidoo D. Novice Occupational therapists experiences of working in neonatal intensive care units in KZN. South African Journal of Occupational Therapy (In review). 2020.

9. Thomas A, Law M. Research utilization and evidence-based practice in occupational therapy: a scoping study. American Journal of Occupational Therapy. 2013;67(4):e55-e65.

10. Hockenberry MJ, Wilson D. Wong's nursing care of infants and children-E-book. Elsevier Health Sciences; 2018.

11. Nightlinger K. Developmentally supportive care in the neonatal intensive care unit: an occupational therapist’s role. Neonatal Network. 2011;30(4):243-248.

12. Royal College of Occupational Therapists. Occupational therapy in neonatal services and early intervention. Practice guideline. 2017:1-52.

13. Craig JW, Smith CR. Risk-adjusted/neuroprotective care services in the NICU: the elemental role of the neonatal therapist (OT, PT, SLP). Journal of Perinatology. 2020;40(4):549-559.

14. Sherry K. Disability and rehabilitation: Essential considerations for equitable, accessible and poverty-reducing health care in South Africa. South African health review. 2014;2014(1):89-99.

15. Hoque M, Haaq S, Islam R. Causes of neonatal admissions and deaths at a rural hospital in KwaZulu-Natal, South Africa. Southern African Journal of Epidemiology and Infection. 2011;26(1):26-29.

16. Robinson JE. Access to employment for people with disabilities: findings of a consumer-led project. Disability and Rehabilitation. 2000;22(5):246-253.

17. Tong A, Sainsbury P, Craig J. Consolidated criteria for reporting qualitative research (COREQ): a 32-item checklist for interviews and focus groups. International journal for quality in health care. 2007;19(6):349-357.

18. Ludema JD, Cooperrider DL, Barrett FJ. Appreciative inquiry: The power of the unconditional positive question. Handbook of action research. 2006:155-165.

19. Guest G, Bunce A, Johnson L. How many interviews are enough? An experiment with data saturation and variability. Field methods. 2006;18(1):59-82.

20. Creswell J, Creswell J. Research design: Qualitative, quantitative, and mixed methods approaches. Sage publications; 2017.

21. Braun, Clarke. Using thematic analysis in psychology. Qualitative Research in Psychology. 2006;3(2):77-101.

22. Fereday J, Muir-Cochrane E. Demonstrating rigor using thematic analysis: A hybrid approach of inductive and deductive coding and theme development. International journal of qualitative methods. 2006;5(1):80-92.

23. Graham. Illustrating triangulation in mixed methods nursing research. Nurse researcher. 2005;12(4): 7-18.

24. Heale R, Forbes D. Understanding triangulation in research. Evidence-Based Nursing. 2013;16(4):98-98.

25. Lubbe W. Best practice guidelines for neurodevelopmental supportive care of the preterm infant: North-West University; 2010.

26. Butler ML. The self-reported perceptions of the multi-disciplinary team regarding standards of neurodevelopmental supportive care in the neonatal intensive care unit 2018.

27. Wallin L, Eriksson M. Newborn Individual Development Care and Assessment Program (NIDCAP): a systematic review of the literature. Worldviews on Evidence-Based Nursing. 2009;6(2):54-69.

28. Legendre V, Burtner PA, Martinez KL, et al. The evolving practice of developmental care in the neonatal unit: a systematic review. Physical & occupational therapy in pediatrics. 2011;31(3):315-338.

29. Spittle A, Orton J, Anderson PJ, et al. Early developmental intervention programmes provided post hospital discharge to prevent motor and cognitive impairment in preterm infants. Cochrane Database of Systematic Reviews. 2015 (11).

30. Lekskulchai R, Cole J. Effect of a developmental program on motor performance in infants born preterm. Australian Journal of Physiotherapy. 2001;47(3):169-176.

31. Hwang A-W, Chao M-Y, Liu S-W. A randomized controlled trial of routines-based early intervention for children with or at risk for developmental delay. Research in developmental disabilities. 2013;34(10):3112-3123.

32. Shung-King M, Lake L, Sanders D, et al. Child and adolescent health: Leave no one behind. South African Child Gauge 2019. Cape Town: Children's Institute.: University of Cape Town; 2019.

33. Beyers B. Experiences of community service practitioners who are deployed at a rural health facility in the Western Cape: University of Western Cape; 2013.

34. Hodgetts S, Hollis V, Triska O, et al. Occupational therapy students' and graduates' satisfaction with professional education and preparedness for practice. Canadian Journal of Occupational Therapy. 2007;74(3):148-160.

35. Robertson DM. Critical thinking and clinical reasoning in new graduate occupational therapists: a phenomenological study 2012.

36. Müller M, Myburgh A, Stock R. The Training and Role of Occupational Therapists in South African Neonatal Intensive Care Units. Johannesburg: University of the Witwatersrand Faculty of Health Sciences, School of Therapeutic Sciences; 2016.

37. Van Wyk H, de Beer M. Inter-professional education: Healthcare students' experiences. South African Journal of Occupational Therapy. 2017;47(2):35-40.

38. King G, Strachan D, Tucker M, et al. The application of a transdisciplinary model for early intervention services. Infants & Young Children. 2009;22(3):211-223.

39. Aita M, Snider L. The art of developmental care in the NICU: a concept analysis. Journal of Advanced Nursing. 2003;41(3):223-232.

40. Aucott S, Donohue PK, Atkins E, et al. Neurodevelopmental care in the NICU. Mental retardation and developmental disabilities research reviews. 2002;8(4):298-308.

41. Copley JA, Turpin MJ, King TL. Information used by an expert paediatric occupational therapist when making clinical decisions. Canadian Journal of Occupational Therapy. 2010;77(4):249-256.

42. Vachon B, Durand M-J, LeBlanc J. Using reflective learning to improve the impact of continuing education in the context of work rehabilitation. Advances in Health Sciences Education. 2010;15(3):329-348.

43. Sharoff L. Integrating YouTube into the nursing curriculum. OJIN: The Online Journal of Issues in Nursing. 2011;16(3): 1-6.

44. VandenBerg KA. Individualized developmental care for high risk newborns in the NICU: a practice guideline. Early human development. 2007;83(7):433-442.

45. Als H, Lester BM, Tronick EZ, et al. Toward a research instrument for the assessment of preterm infants' behavior (APIB). Theory and research in behavioral pediatrics: Springer; 1982. p. 35-132.

46. Koch T. Establishing rigour in qualitative research: the decision trail. Journal of advanced nursing. 1994;19(5):976-986.

CHAPTER 3: SYNTHESIS

3.1 INTRODUCTION

Infant mortality rates have significantly declined in the past 20 years in South Africa since the initiation of the MDG's and subsequent SDG's (Shung-King et al., 2019). There is however, still a need to place emphasis on child morbidity as a result of preterm birth complications and other neonatal risk factors that may result in long term neurological sequelae (Aylward, 2014b; Mwaniki et al., 2012). Managing the outcomes of morbidity is within the OT scope of practice. Thus, it becomes imperative that early recognition of neurodevelopmental disorders and the care of the developing brain through NDSC is implemented in hospital NICU's and so that the severity of morbidity may be reduced.

To the best knowledge of the researcher there is limited research available on the role of the OT in the NICU and in providing care to high-risk infants within the South African context. Findings from a recent study in the province of KZN revealed that junior community service OT's did not completely understand their role with high-risk infants and expressed having have insufficient knowledge and skills to support this particular population (Hardy et al., 2020). The aim of this current study was to explore the perceptions of full time employed OT's working with neonates in the public health sector of KZN, by discovering the current knowledge-to-practice gaps, and visualizing the expertise required to support high-risk infants.

A conceptual framework combining an AI approach and KT process was developed by the researcher to guide the study. This framework guided the development of the aims and objectives, the discussion guide for the focus groups, and data analysis. The framework also assisted in discovering current OT and neonatal care practices in the public health sector by exploring the factors that motivated therapists to work with neonates, ascertaining how therapists acquired and synthesised their knowledge to work with high-risk infants, and how therapists sustained their acquired and synthesised knowledge within their specific settings to promote sustainability of their interventions. The framework allowed for further discovery and exploration into the contextual barriers and adaptations made by therapists in their intervention strategies with high-risk infants. Lastly, the framework assisted therapists to visualise and dream of the ideal OT and neonatal environment to support high-risk infants in various levels of care within public health institutions in KZN.

The qualitative methodology of the study assisted in achieving the aim, and answering the research questions, by conducting online focus group discussions with 17 full time employed OT's who worked

with neonates in various levelled public health facilities in KZN. The findings from the focus groups allowed the researcher to gain insight into the knowledge-to-practice gaps and to obtain a glance of what therapists visualise as being the ideal knowledge to practice interventions to support high-risk infants. The findings of this study may assist academics, and experts in the field to design contextually appropriate and resource efficient neonatal intervention content for occupational therapists, with an implementation of the intervention content for viability at a later stage with therapists in the public health sector of KZN. Transcripts of the study was analysed using a thematic analysis and inductive deductive reasoning. Five main themes emerged from the process of data analysis. The researcher wrote one manuscript to document the methodology, results, and findings of the study. The consensus amongst participants from the focus groups is indicative that the results from the study could be reflective of the perceptions of the greater population of OT's who support high-risk infants in the public health sector of KZN.

3.2 KEY FINDINGS AND IMPLICATIONS

The first objective of the study was to explore what factors motivated OT's to work with neonates. Therapists outlined both facilitators and inhibitors in providing intervention to high-risk infants. A major inhibitor being that there was a lack of funding for skills development from health facilities for therapists to expand on their clinical knowledge. Post graduate training, courses and workshops are not always affordable to therapists, but was introduced as mandatory by the Health Professions Council of South Africa (HPCSA) in 2007, to improve on the quality of care provided to patients. Compliance in continuous professional development (CPD) has since been poor, with only 35% of health professionals fulfilling their requirements (Maharaj, 2013). This concurs with findings from studies in which barriers to CPD with public sector employees were mainly unaffordability of courses (72%) amongst other factors (Hardy et al., 2020; Maharaj, 2013).

The HPCSA guidelines state that OT undergraduate training in South Africa must cover six months in the field of paediatrics. However, assessment and intervention with neonates are not specified (HPCSA, 2019). Participants in this study felt that their undergraduate training did not adequately provide them with the knowledge and skills to work with high-risk infants. As new therapists employed in facilities that required the service, they had to self-learn assessment and intervention strategies to apply to the NICU and high care environments. This aligns with studies on junior OTs in South Africa, who suggest that their theoretical and practical undergraduate training in neonatal care was not sufficient to apply in clinical practice (Hardy et al., 2020; Robertson, 2012). The HPCSA guidelines suggest that therapists must adapt their present skills, using clinical reasoning and problem solving to service a variety of needs and diagnoses (HPCSA, 2019). This includes servicing the NICU regardless of training received in the field.

In developed countries, OT and neonatal practice are considered a specialised field that requires advanced training, years of experience in paediatrics and continuous mentoring (Nightlinger, 2011; Royal College of Occupational Therapists, 2017). Inexperience and trial and error interventions can cause harm to a high-risk population that is already susceptible to increased morbidity and mortality due to prematurity and other medical conditions. Therapists identified ethical practice as being crucial in the care of the infant. OTs should not intervene when it is not necessary and if they are unsure of intervention strategies, as this could put infants at risk of harm. This corresponds with the HPCSA ethical guidelines for good practice in the health care professions (HPCSA, 2000). However, the ethical guidelines contradict with other HPCSA guidelines as it also suggests that therapists must use their present knowledge to apply to clinical practice. If OT's do not have enough training or experience in working with neonates, there is the possibility of adverse events that could occur. OT's need to be theoretically and practically trained and educated in neonatal care at an undergraduate and post graduate level, to provide safe and valuable intervention to the high-risk infant.

OT staffing levels in all facilities are an inhibitor to consistent in and outpatient neonatal care. A moratorium placed on all rehabilitation posts in 2016 by the KZN Department of Health (DOH), resulted in posts remaining vacant upon resignation (KZN OT Forum, 2019a). Participants reported that it was difficult to monitor their follow up programmes for high risk infants, as patients defaulted often and there was time constraints and not enough staff to locate defaulters (Hardy et al., 2020) . This could be because of a parent's decreased understanding of the importance of complying with follow up appointments. Other reasoning for defaulting, could be due to the high levels of poverty in a low resourced rural province such as KZN, where parents are often unable to afford transportation to health facilities (Shung-King et al., 2019; Van Stormbroek & Buchanan, 2016). OTs are regarded as "specialists" in infant development, sensory regulation, positioning and family centred care (Nightlinger, 2011). Therapists would ideally want a full-time OT servicing the NICU, unfortunately due to staff shortages this is not possible. Insufficient staffing not only affects the quality-of-service delivery but also the mentorship, support, and supervision of junior therapists in providing safe intervention to high-risk infants.

Facilitators in the public sector were recognised by participants as being the medical management of some health facilities, the clinical head of paediatric departments as well as the paediatric doctors. Management and medical staff supported the OT role in neonatal care, and early childhood intervention in paediatrics. Hospital management acknowledges OT services once they can see the benefits of early developmental care, especially with cases of morbidity. Receiving support from management contributes to the successful implementation of NDSC, and may decrease the expenses of the facility by improving the quality of life of the infant (Butler, 2018; Lubbe, 2010). Research has identified that the early implementation of NDSC encourages the overall development of high-risk

infants (Legendre et al., 2011; Wallin & Eriksson, 2009). It has also been recommended in several studies that high-risk infants be referred to OT to provide early intervention programmes to promote neurocognition, performance in areas of occupation, maternal mental health, and family centred care as a means of sustaining knowledge and supporting the infant and parent dyad (Butler, 2018; Hwang et al., 2013; Lekskulchai & Cole, 2001; Lubbe, 2010; Spittle et al., 2015).

Therapists did not have exposure in clinical practice with neonates during their undergraduate training but were required to service this population when placed in community service. OT and hospital-based paediatrics require that all infants and children with a medical diagnosis must be assessed and treated accordingly in all spheres. It was found that participants who work in paediatrics generally developed an interest in working with children and neonates. Further training in neonatal care increased their theoretical and practical knowledge, confidence, and interest in the field. Studies have found that therapists with little clinical experience, feel incompetent, have decreased self-confidence, engage in interventions with flawed clinical reasoning and face challenges with their level of skill and what is expected of them in the work environment (Hodgetts et al., 2007; Robertson, 2012). Participants outlined that observing short and long term positive developmental outcomes with implementing early intervention encouraged an interest in working with high-risk infants. Other participants had no interest in working with neonates but followed the referral process, standard operating procedure (SOP) of the facility and the OT scope of practice to intervene only as required. This is aligned with findings from a study in which OTs did not work in the NICU or attend any courses or training to develop their skills due to a lack of interest in neonatal care (Hardy et al., 2020). The blanket covering of wards such as the NICU and high care units were not possible due to inadequate staffing. The SOP's in some facilities require OT services only upon a referral basis from medical staff and other disciplines. A variety of reasons influence a therapists interest in a particular field of practice; clinical experience, personal competence, job availability, way of life and personal conditions (Richardson & Rugg, 2006). In South Africa specialised fields within the OT scope of practice is not recognised by the HPCSA. Rather therapists have an interest in clinical practice areas and expand on their skills through CPD accredited training and courses. The scarcity of job opportunities for OT in the public health sector of KZN and a saturation of job availability in the private sector leaves little opportunity for choice of clinical work and personal growth. Therefore, leaving therapists to stay in jobs that may not be satisfying and fulfilling so that they are able to meet their financial needs.

The second objective of the study was to discover how OTs sourced information and knowledge to support the neonate. Participants acquired information and knowledge from a range of professionals in the MDT such as doctors, specialist paediatricians, neonatologists, dietitians, physiotherapists, and speech therapists. Working relationships were formed between disciplines with the implementation of knowledge brokerage to learn and share the expertise of individual roles in supporting the high-risk

infant whilst still working as a team. This is consistent with studies in which working in a MDT and sharing knowledge, has been highlighted as being beneficial to ensure consistency in the care of the neonate (Aita & Snider, 2003; Aucott et al., 2002; Butler, 2018; King et al., 2009; Lubbe, 2010; Müller et al., 2016; van Wyk & de Beer, 2017). NDSC is known as a MDT approach, however it is imperative that disciplines understand their individual roles in the infants intervention plan (National Association of Neonatal Therapists, 2014). This describes interprofessional responsibility and identity as a part of a collaboration of services.

Nursing staff are viewed as essential role players in the NICU environment. They are a constant presence in the unit, who work closely with the MDT, infant and parent. Nurses can provide information to the therapist when required, follow through with ward therapy programmes and prompt medical staff to refer high-risk infants to OT. However, nursing staff in public health facilities are rarely trained in NDSC and are unable to identify and interpret infant behaviours like some members of the rehabilitation team, who have received training (Lubbe, 2010). Information is shared amongst the MDT during in-service training, grand ward rounds and using social media platforms such as WhatsApp. Research has found that an affordable way of increasing clinical competence, sharing knowledge and promoting CPD in the public sector is through in-service training amongst OTs and other members of the MDT (Hardy et al., 2020). In other studies, in service training on the concept of NDSC was viewed as a supporting factor, whereas if no in-service training was provided there was poor implementation of NDSC amongst the MDT (Butler, 2018; Jacobs et al., 2018; Lubbe, 2010). The development of departmental in-service rosters in OT, other rehabilitation and paediatric departments may assist in sustaining knowledge brokerage in neonatal care amongst the MDT. The use of internal communication channels through social media platforms such as WhatsApp has risen in the 21st century amongst health care professionals who utilise the application to refer, discuss and share patient cases and knowledge (Boulos, Brewer, Karimkhani, Buller, & Dellavalle, 2014; Boulos, Wheeler, Tavares, & Jones, 2011). WhatsApp is a cost effective, efficient application that promotes accessible communication with the MDT, strengthens learning, promotes patient privacy amongst treating clinicians and improves the overall holistic management of the patient (Khanna, Sambandam, Gul, & Mounasamy, 2015; Mars & Scott, 2016; Nardo et al., 2016).

Information to support the infant and parent was acquired through working in the NICU and from other sources such as OT referral forms, admission booklets, interviews with the parent and clinic immunisation booklets. These sources provide information on the infant's medical state, social circumstances and other assessment and intervention strategies received from the MDT. Participant's acquired knowledge and skills through textbooks in their departments, online searching, consulting with experienced colleagues, DOH nursing policies, journal articles, courses, and support from the University of KZN academic supervisors at specific clinical placement sites. Findings from this study

have correlated with results from other studies in which professionals used Google and other media platforms to develop knowledge and skills, as well as to source information to inform their clinical practice (MacWalter, McKay, & Bowie, 2016; Sharoff, 2011). The legitimacy of accessing information from unknown internet sources must be acknowledged as the information could be out of date, lack substantial EBP and may not align with the needs of the South African health context (Sharoff, 2011). The Neonatal Association of Neonatal Therapists (NANT) was identified by participants as being an authentic online source for information that can assist all rehabilitation therapists to support the high-risk infant and family.

As junior therapists, having access to mentorship from senior therapists in the province, colleagues and peers who are experienced in the field of neonatal care aided them to assess and provide safe and correct intervention to high-risk infants. This concurred with other studies in where junior therapists found that having access to a supervisor who had experience in neonatal care helped to develop their clinical abilities in the field whilst providing ongoing support and job training (Hardy et al., 2020; Van Stormbroek & Buchanan, 2016). Junior therapists were allocated mentors in the form of permanent therapists across the KZN province. This new initiative was implemented at the beginning of 2020 and will be evaluated by the KZN OT Forum at the end of the year.

Therapists who were passionate about using EBP in neonatal care accessed and shared applicable journal articles with colleagues. The use of EBP assists health professionals in policy development, translating research findings into practice, and by integrating relevant evidence, clinical experience, and patient needs to make informed decisions and provide expert clinical care (Nightlinger, 2011; Rheeder, Lubbe, & Pretorius, 2017) . Other studies have outlined that experienced OTs used EBP in clinical decision making, using online research, reading of relevant literature, and increasing knowledge and skills by attending courses and workshops for professional development in fields of interest (Copley et al., 2010; Sharoff, 2011; Thomas & Law, 2013; Vachon et al., 2010).

The ‘Little Steps’ course focusing on NDSC for preterm infants was identified as the most common course attended by OTs in this study. Therapists gained confidence and clinical competence in the management of high-risk infants. This aligns with findings from two other studies that have recognised the course to be useful in the operationalisation of NDSC amongst the MDT working in the NICU (Hardy et al., 2020; Lubbe, 2010). The course is not aimed only at training OTs but on empowering the MDT with knowledge and skills on developmental care, identifying infant behaviours, feeding, positioning, environmental adaptations, and other intervention modalities. Some therapists were not able to attend the course personally but had received in-service training from other OTs. Knowledge brokerage was then carried out at individual institutions with the MDT servicing the NICU. Other courses attended by some therapists were the Neurodevelopmental Therapy Advanced Baby course,

the Infant Sensory Integration course and short courses in neonatal care offered by the University of KZN. Attending a variety of courses assist in providing a holistic and integrated approach to the treatment of high-risk infants, unfortunately attending courses may not be affordable to all therapists.

The synthesis of acquired information, knowledge and skills were thought to be from a therapist's clinical reasoning, experience, and practice. Experience plays a vital role in increasing the self-confidence of an OT, together with integrating research into practice (Thomas & Law, 2013). This study has found that therapists with 2-5 years of clinical experience synthesise information that they have sourced, by using trial and error in treatment modalities to see whether it works for their patients. As mentioned previously, trial and error interventions may pose as being detrimental to the neurodevelopment of high-risk infants.

Information is further acquired using DOH nursing policies and protocols. These assist therapists in identifying patients that are mild to severely at risk of mortality and morbidity. OTs develop their protocols for their institutions to manage the high-risk infant, as there are no OT specific guidelines or protocols available from the KZN DOH. This aligns with findings from a study that found that junior therapists did not have any standardised protocols to guide their NICU practice (Hardy et al., 2020). In an alternate study policies were not found on NDSC practices in several NICUs in South Africa (Lubbe, 2010). Policies that govern neonatal care can assist in the successful implementation of NDSC amongst the MDT. A lack of DOH policies, protocols and guidelines for the OT role and specific practice in neonatal care could be an area for future research. This may assist in implementing a standard of care across the KZN province in providing quality OT services and decreasing trial and error interventions by inexperienced therapists.

The third objective of the study was to explore how OTs synthesise and sustain knowledge to translate it into practice with neonates. Inhibitors and facilitators were identified in sustaining knowledge in neonatal care. Therapists identified frequent staff rotations and a disinterest of junior doctors to refer infants to OT as being an inhibitor in sustaining neonatal services. These findings align with other studies where the frequent rotation of doctors in the NICU, made it challenging to sustain knowledge of NDSC and an understanding of the OT role in the NICU (Hardy et al., 2020; Lubbe, 2010). Other studies relating to doctor's attitudes towards the implementation of NDSC, found that ward rounds do not follow set times, with a disregard of quiet time in the NICU and of other environmental adaptations (Lubbe, 2010). The focus on rehabilitation services and NDSC is not prioritised as medical concerns take precedence (Butler, 2018). Inadequate support from the medical staff in the NICU acts as an inhibitor in sustaining knowledge of the OT role and of NDSC practices. Therapists considered the provision of in-service training to the MDT on the OT role in the NICU, and on NDSC practices as being a facilitator in sustaining knowledge in some institutions. Providing in-service training to the

MDT, facilitates knowledge sustainment on the OT role, increases referrals, improves infant developmental outcomes, and optimises NDSC practices (M. S. Brown, Ohlinger, Rusk, Delmore, & Ittmann, 2003; Hardy et al., 2020; Jacobs et al., 2018; Lubbe, 2010). However, findings from this study have also indicated that in smaller institutions there is a still a disregard for OT services although regular in-service training is done with the MDT. Therefore, infants are generally not referred. This may lead to poor long-term developmental outcomes of the infant. EBP in the NICU and high care units must be implemented by the MDT, with specific focus on the role of the OT as their vast knowledge in child development, ideologies of holistic intervention strategies, builds a basis for an exclusive and valued influence on the neonate in under-resourced environments within the public health sector of KZN.

Sustaining knowledge through family-centred care was identified as a facilitator, as parents spent more time in the NICU than any other member of the MDT. Therapists provided support, and education on NDSC practices to parents individually or through group therapy. Interventions were adapted according to their specific cultural and contextual needs. The participation of the infant and the family in culturally appropriate interventions is a priority in neonatal care (Nightlinger, 2011). Parents gain valuable knowledge and skills from OT's that value the family role, are educated in NDSC, infant medical diagnoses, and who are sensitive to their concerns, needs and preferences (Vergara et al., 2006). Studies have also found that family-centred care decreases the costs of the institution through shorter admission times, lessens parent stress, promotes infant-parent bonding, and improves overall infant development (Bruce et al., 2002; Smith, Desai, Sira, & Engelke, 2014; Westrup, 2014).

Therapists employed at rural facilities in this study utilised community health care workers as a means of sustaining knowledge. Community workers were educated on identifying high-risk infants in their areas to refer to the hospital for assistance and advising parents on basic contextually appropriate intervention strategies. They assisted in locating high-risk infants in communities where parents defaulted follow up programmes. Literature has found that community health care workers have a significant role in assessing and advising people on their health care needs and what services they can access at health care facilities for specific problems. They are trained by professionals to understand the basics of medical diagnoses, managing chronic diseases, disease prevention, and promoting good health outcomes (Uys, 2002). Community health care workers may play a vital role in sharing and sustaining knowledge at a community level whilst assisting the MDT in locating and identifying infants at risk to refer them to health care facilities for appropriate intervention.

The fourth objective of the study was to explore how OT's overcome barriers and what enables them to adapt their intervention strategies to their specific contextual needs. EBP guidelines for NDSC

come from first world countries and are adapted by professionals to suit the South African context and cultural needs (Als et al., 1982; Hardy et al., 2020; Lubbe, 2010; VandenBerg, 2007). Programmes such as the Newborn Individualised Developmental Care and Assessment Program (NIDCAP) were developed internationally and therefore are not suitable for under-resourced settings (Lubbe et al., 2012). International research findings, and guidelines are adapted by therapists according to their resources and the population they service. Resources are provided in both English and IsiZulu languages, so that caregivers can understand intervention programmes and apply them accordingly. Designing contextually appropriate programmes that are only picture-based may assist in relaying information and suggesting intervention methods to caregivers that are illiterate. One of the high-risk factors identified by therapists was that of young mothers. Emotional support, education on breastfeeding, caring for a new-born infant, and the importance of attending follow up high risk baby programmes was thoroughly conducted with young mothers. This concurs with findings from a study where young mothers were recognised as being challenging to form therapist-client relationships with, and were unreceptive to education in the NICU (Hardy et al., 2020). This could be due to multiple social factors such as being overwhelmed by becoming a parent and having birthed a child that is premature or unwell, breast feeding problems, having inadequate family support systems, stress with regards to their financial statuses, and returning to school.

A typical day in the NICU was described as “scary”, brief, and chaotic due to advanced medical equipment, working around the sleep-wake states of the infant and the parent not always being present in the NICU. Therapists engaged with doctors and nursing staff about the medical and social history of the infant before assessing and intervening. For some therapists the NICU environment had a supportive MDT with an understanding of the OT role. Frequent in-service training was done with the MDT on NDSC practices and education with the parents individually and in groups. Therapists assess the mothers mental state and infant-parent bonding before sharing knowledge and training on NDSC, the infant’s diagnosis and other information. Post-natal depression and psychosis are common psychiatric illnesses that occur shortly after birth. Difficulties experienced with this diagnosis prevents mothers from caring for and bonding with their babies (Cooper et al., 2009). Therefore, they are not receptive to intervention and other requirements of the NICU. It is within the OT scope of practice to identify post-natal mental illness and to refer the mother accordingly to a psychologist and psychiatrist for further management and support.

The ideal OT to service the NICU needs to be trained in neonatal care, confident, compassionate, assertive, and motivated to encourage practice change amongst other professionals included in the MDT. Junior therapists are not recommended to work in the NICU due to their lack of training and experience. This correlates with findings from other studies in which OTs who service the NICU are required to have post-graduate education in the field of neonatal care, continuous professional

development with neonates, years of clinical experience in working with paediatrics and high-risk infants as well as ongoing job training with mentors who are specialists in neonatal care (Butler, 2018; Hodgetts et al., 2007; Nightlinger, 2011; Robertson, 2012). Unfortunately, many therapists that are employed in the KZN public health sector are community service therapists or junior therapists, therefore leaving no option in whom services the NICU as service delivery demands must be met. Being trained to work with high-risk infants was identified as increasing the confidence of a therapist to work in the demanding NICU environment. This study further acknowledged that the undergraduate OT programme in South Africa was incomprehensive in equipping junior therapists to work with high-risk infants. A study has found that junior therapists were not trained adequately at an undergraduate level at South African tertiary institutions in NICU care practices and to intervene with high risk infants resulting in feeling overwhelmed in supporting this population and a poor ability in advocating for NDSC changes with the MDT servicing the NICU (Hardy et al., 2020).

An ideal day in the NICU is having positive and supportive working relationships with the MDT, time, and flexibility to provide individualised infant and family centred care, attend MDT ward rounds and to structure the workday according to the infant and parent's needs. Parent engagement, family-inclusive care and continuous parent support have been identified in international guidelines and studies as playing a crucial role in OT NICU practice (Lubbe, 2010; Nightlinger, 2011; Royal College of Occupational Therapists, 2017). Regrettably, OT staff shortages in the KZN public health sector is a barrier in providing consistent care to the infant and the parent as therapists service other clinical areas and carry multiple other roles in their institutions. Infrastructure shortages in public health care facilities to provide private spaces for families to be counselled and bond with their infant also decreases the possibility of counselling rooms being a part of the ideal neonatal toolbox. Participants envision the ideal neonatal toolbox to consist of standardised South African assessment tools and EBP protocols and guidelines specific to OT whilst other therapists felt like they could not envision what the ideal would be, as they received no further training in neonatal care. South African studies have found that there is an absence of OT contextually appropriate protocols or practice guidelines that are specific to the South African population in the field of neonatal care, this, in turn leads to inconsistent quality of interventions provided to high-risk infants and families in the KZN public health sector (Hardy et al., 2020; Lubbe et al., 2012). Other dreams of the ideal neonatal toolbox include well-trained therapists for the NICU, equipment such as nests, Kangaroo Mother Care wraps, sensory toys, materials in the form of parent resources for demonstration purposes that stay in the NICU therefore keeping in line with infection prevention control, and being able to advocate for consistent environmental adaptations as supported by NDSC best practice guidelines (Lubbe, 2010).

3.3 RECOMMENDATIONS

The following recommendations are based on the findings of this research study and areas requiring further research**.**

3.3.1 Policy and Protocol

As a gap has been identified in the lack of policy, protocols, and guidelines specific to the OT scope of practice in neonatal care in the public health sector of KZN, it is recommended that an expert panellist is formed. This panellist can consist of experienced OTs in the public health sector (more than five years of experience) with interest in NDSC and working with high-risk infants, researchers, and academics in the field of OT and paediatrics, paediatric nurses and doctors, chairpersons of the OT Forum for KZN as well as KZN DOH representatives for paediatric and child health. This research study can assist in the initiation of developing OT specific policies, protocols, and guidelines on best practice interventions for experienced and junior therapists in KZN. The formation of these policies is imperative to guide therapists in their interventions with a population that is at risk of morbidity and mortality. It will also contribute to the vision of the ideal neonatal toolbox.

3.3.2 Policy and Protocol specific to COVID19

With the current global COVID19 pandemic, the OT role in the NICU has been unclear due to infection control, increased exposure of various health professionals and the probable risk associated with the spread of the virus. Available research in the field of neonatology is still being investigated, and currently appears to remain uncertain with regards to NICU access by some health professionals. A study done in America has found that several institutions have decreased the entry of OT, speech therapy, physiotherapy and other allied health professionals by 28% (Mahoney et al., 2020). As the pandemic has evolved institutions have been adapting their policies and protocols (Salvatore et al., 2020). This has resulted in decreasing the amount of time that mothers spend with their infants which may have lasting consequences on infant-parent bonding (Virani et al., 2020). Private rooms assist in making infection prevention control measures easier to implement (O'Callaghan, Dee, & Philip, 2019). However, this is not possible in public health institutions in a LMIC such as South Africa.

As the world adapts to living with changes due to COVID19, the role of OT in the NICU with regards to NDSC and parent support remains unchanged. Developmental care in the NICU is a priority. The advice given to parents with regards to infection prevention control such as wearing a mask when bonding with the infant, social distancing in border mother facilities, washing hands regularly and breast cleansing should be emphasised during intervention by health professionals (Davanzo et al., 2020; Puopolo, Mark, Hudak, Kimberlin, & Cummings, 2020; Royal College of Obstetricians & Gynaecologists, 2020). It is recommended that the KZN OT Forum form a team of public health OTs

to develop a SOP that relates to infection prevention control not only for working in the NICU, but in other therapeutic areas. This will maintain a standard care of across the province as well as guide junior therapists on specific infection prevention control policies with regards to COVID19.

3.3.3 OT Post-graduate Training Recommendations

Affordable contextually appropriate training programmes in neonatal care can be made available by the KZN DOH Disability and Rehabilitation Programme. Alternatively, the DOH can extend the sponsoring of or subsidising of courses to therapists so that they are able to expand their clinical knowledge and skills. Training in NDSC should be offered in advanced practice courses in neonatal care with the development of a continuing education program for empowering therapists.

The KZN OT Forum can identify OT Neonatal Champions in the province who are sponsored to go on specialised training by the DOH. Champions can provide CPD workshops to therapists in the province, via the KZN OT Paediatric Interest Group for an affordable fee. These fees can be placed into the forum kitty that will be able to assist in funding future training programmes for therapists in the province. Therapists whose training needs are sponsored must sign contracts to be employed with the DOH for up to five years or more to ensure a return on the DOH investment as well as to sustain knowledge brokerage in neonatal training and a standard of care in neonatal interventions for all OT's in the province. The Paediatric Interest Group consists of experienced therapists and mentors in the province who provide support and resources to experienced and junior therapists in the province. It is therefore a maintainable platform for knowledge enquiry, knowledge brokerage, and to sustain knowledge in the province. However, the OT staff shortages at all facilities need to be considered in the operationalisation of the KZN Paediatric Interest Group as clinical practice is prioritised before training and support needs. It is presently difficult for all interest groups to be operational in the KZN public health sector.

Journal club programmes and in-service training amongst OT's in districts or in the province can be initiated on online platforms such as ZOOM to ensure the translation of EBP in neonatal care and for therapists to keep updated with recent scientific evidence. Journal clubs can be CPD accredited by the KZN OT Forum to encourage and motivate therapists to participate and attend.

3.3.4 OT Undergraduate Training

OT undergraduate curriculum across the country needs to outline the role of OT in the NICU. The curriculum needs to include training in NDSC practices and the management of the high-risk infant and family through comprehensive theoretical knowledge, the provision of a simulated NICU environment and practical training. This can be done by providing students with case studies, dolls

and practical videos demonstrating therapist's practice intervention in the NICU. Community service therapists placed in KZN come from universities across South Africa. The inclusion of neonatal training in the curriculum is imperative as community service therapists outweigh the number of permanent therapists in the KZN province. They are required to practice in all fields once employed and to work independently, as there are no OT clinical supervisors to provide on the job training and support at most institutions in the KZN public health sector.

Relationships amongst academics from the Discipline of OT at a university level, experienced clinicians in the public health sector, junior therapists, and students can collaborate towards developing a scholarship of practice model to promote the integration of research into clinical practice.

3.3.5 OT Role Recognition

The OT role, responsibilities, and scope of practice in working with high-risk infants in NICU's, high care units and in follow up programmes can be educated to the management of all health care institutions and head of paediatric departments in the KZN public health sector as an approach to providing holistic and integrated intervention to the infant and the family. This needs to be put into place by means of a workshop offered to medical managers and clinical heads of paediatric departments in KZN by the chairperson of the OT Forum together with the KZN Disability and Rehabilitation coordinator and the Head of Paediatrics and Child Health. The possible decreasing of costs to the institution through early childhood intervention and follow up high risk baby programmes should be proven as OT services may assist in decreasing poor outcomes of morbidity. The importance of the OT role can be disseminated via managers to paediatric staff to ensure the sustainability of OT services in the NICU. Therapists in all institutions must implement continuous training on NDSC offered by the OT to the MDT. This highlights the importance of junior therapists being trained in NDSC so that they can form trusting working relationships, provide knowledge brokerage with the MDT and advocate for OT services in the NICU.

3.3.6 Recommendations for Future Studies

This research study has identified the opportunity for further research to be carried out with permanent OTs servicing the public health sector in other provinces in South Africa. Comparisons and similarities with regards to identifying the knowledge to practice gaps for therapists supporting high-risk infants in all provinces can be documented in relation to the findings of this study.

Research into OT specific best practice guidelines that are contextually appropriate to various levelled health care institutions in the KZN public health sector should be studied and developed by multiple stakeholders with advanced training, knowledge, and expertise in the field. Guidelines can be put into

practice by OTs, analysed and evaluated for effectiveness by researchers to form the ideal KTA intervention for high-risk infants. In future studies, this can be adapted and adjusted to accommodate the contextual requirements of other public health institutions in various provinces so that guidelines for OT neonatal practice is standardised throughout the country. Furthermore, it is recommended that research on the impact of COVID19 in providing OT services in the NICU and its effects on the implementation of NDSC with high-risk infants and their families be explored.

The development of standardised South African assessment tools for OT neonatal care should be investigated in future studies. This will assist in having a tool that is sensitive to our context and population. The tool could be used to generate data for future OT neonatal research studies and represent South Africa on an international level in terms of neonatal research.

3.4 LIMITATIONS

A response bias to participating in the study could have been formed as therapists who did not want to contribute to research, did not work in the NICU, felt incompetent in neonatal practice and had a decreased interest in working with neonates may not have responded to the research invitation. It is likely that more undesirable perceptions and responses of therapists was not adequately depicted in the findings. Most therapists who participated in this study completed their undergraduate training at the same tertiary institution. This could have provided a systematic bias to the findings. However, non-probability sampling was used to recruit participants from the population of interest (all occupational therapists employed full time in the KZN DOH) to volunteer their participation in the study (Malone, Nicholl, & Tracey, 2014). All therapists who met the inclusion criteria were invited to participate on their own free will, without the researcher being aware of the university in which they had completed their undergraduate training. This information was only received in the demographic questionnaire sent to participants after the discussion groups were conducted. The tertiary institution in which most therapists completed their undergraduate training is also the only one training occupational therapists in KZN. Therefore, making it likely that therapists employed in KZN were also trained at the only institution available in the province.

3.5 CONCLUSION

The OT role in neonatal care is recognised as a specialised field of practice internationally. This study has answered the research question by recognising multiple knowledge to practice gaps of permanently employed OTs in the public health sector of KZN. Gaps were identified as a lack of funding by the DOH for further neonatal training, courses and workshops for therapists being unaffordable, severe OT staff shortages, a poor acknowledgement of the OT role in the NICU with a

lack of support from some medical staff, incomprehensive undergraduate training in neonatal practice, and a lack of OT specific protocols, guidelines, and policies to provide a framework for neonatal interventions. This study answered the second research question by identifying who the ideal OT for the NICU should be, what the ideal day in the NICU should look like and what the ideal toolbox for neonatal care should entail. Personal characteristics that should portray the ideal OT to work with high-risk infants was identified. Having enough time, and supportive working relationships amongst the MDT was described as an ideal day in the NICU. Whilst the ideal toolbox was described as having OT specific neonatal protocols using EBP, a counselling room for parents, materials, and equipment specifically for the NICU, South African standardised neonatal assessments, trained therapists, and the provision of therapy programmes and reading materials for the parent and infant on discharge.

The findings of this study may assist academics, and experts in the field to design neonatal intervention content for occupational therapists that is suitable for low resourced settings. An execution of the intervention content for feasibility with therapists in the public health sector of KZN can occur at a later stage. The development of future OT specific best practice guidelines or policies in neonatal care, increasing the possibility of OT's in the public health sector receiving training in neonatal care, and informing undergraduate curriculum training requirements in supporting high risk infants may contribute towards a standardisation of care with regards to OT and neonatal practices in KZN

REFERENCES

Adair, B., Ullenhag, A., Keen, D., Granlund, M., & Imms, C. (2015). The effect of interventions aimed at improving participation outcomes for children with disabilities: A systematic review. *Developmental Medicine and Child Neurology, 57*(12), 1093-1104.

Aita, M., & Snider, L. (2003). The art of developmental care in the NICU: A concept analysis. *Journal of Advanced Nursing, 41*(3), 223-232.

Als, H. (1986). A synactive model of neonatal behavioral organization: Framework for the assessment of neurobehavioral development in the premature infant and for support of infants and parents in the neonatal intensive care environment. *Physical and Occupational Therapy in Pediatrics, 6* (3-4), 3-53.

Als, H., Lester, B. M., Tronick, E. Z., & Brazelton, T. B. (1982). Toward a research instrument for the assessment of preterm infants' behavior (APIB). In *Theory and research in behavioral pediatrics* (pp. 35-132): Springer. Boston, MA.

Altimier, L., Hunter, J., & Lee, L. (2015). *Neonatal Intensive Care Units,* Chapter 21 pp. 595-635. *Occupational Therapy for Children and Adolescents*: Elsevier. St. Louis.

Anderson, E. E., & Corneli, A. (2017). *100 questions (and answers) about research ethics* (Vol. 5): Sage Publications. United States.

Anney, V. N. (2014). Ensuring the quality of the findings of qualitative research: Looking at trustworthiness criteria. *Journal of Emerging Trends in Educational Research and Policy Studies, 5*(2), 272-281.

Archibald, M. M., Ambagtsheer, R. C., Casey, M. G., & Lawless, M. (2019). Using Zoom videoconferencing for qualitative data collection: Perceptions and experiences of researchers and participants. *International Journal of Qualitative Methods, 18*.

Aroni, R., Goeman, D., Stewart, K., Sawyer, S., Abramson, M., & Thein, F. (1999). *Concepts of rigour: When methodological, clinical and ethical issues intersect.* Paper presented at the Association for Qualitative Research Conference, Melbourne.

Askin, D., & Wilson, D. (2011). The high-risk newborn and family. *Wong's Nursing Care of Infants and Children, 9*, 314-389.

Aucott, S., Donohue, P. K., Atkins, E., & Allen, M. C. (2002). Neurodevelopmental care in the NICU. *Mental Retardation and Developmental Disabilities Research Reviews, 8*(4), 298-308.

Austin, B., Downing, C., & Hastings-Tolsma, M. (2019). Experience of neonatal intensive care unit nurses in providing developmentally-supportive care: A qualitative study. *Nursing and Health Sciences, 21*(3), 336-344.

Aylward, G. P. (2014a). Neurodevelopmental outcomes of infants born prematurely. *Journal of Developmental and Behavioral Pediatrics, 35*(6), 394-407.

Aylward, G. P. (2014b). Update on neurodevelopmental outcomes of infants born prematurely. *Journal of Developmental and Behavioral Pediatrics, 35*(6), 392-393.

Babaei, H., & Dehghan, M. (2018). Study of causes of neonatal mortality and its related factors in the neonatal intensive care unit of Imam Reza hospital in Kermanshah, Iran during 2014-2016. *International Journal of Pediatrics, 6*(5), 7641-7649.

Barrett, F. J. (1998). Coda—creativity and improvisation in jazz and organizations: Implications for organizational learning. *Organization Science, 9*(5), 605-622.

Basaza, R., Kinegyere, A., Mutatina, B., & Sewankambo, N. (2018). National framework for the sustainability of health knowledge translation initiatives in Uganda. *International Journal of Technology Assessment in Health Care, 34*(1), 120.

Beck, S., Wojdyla, D., Say, L., Betran, A. P., Merialdi, M., Requejo, J. H., ... Van Look, P. F. (2010). The worldwide incidence of preterm birth: A systematic review of maternal mortality and morbidity. *Bulletin of the World Health Organization, 88*, 31-38.

Bennett, S., Tooth, L., McKenna, K., Rodger, S., Strong, J., Ziviani, J., Gibson, L. (2003). Perceptions of evidence-based practice: A survey of Australian occupational therapists. *Australian Occupational Therapy Journal, 50*(1), 13-22.

Beyers, B. (2013). *Experiences of community service practitioners who are deployed at a rural health facility in the Western Cape.* University of Western Cape: South Africa.

Bhutta, A. T., Cleves, M. A., Casey, P. H., Cradock, M. M., & Anand, K. J. (2002). Cognitive and behavioral outcomes of school-aged children who were born preterm: A meta-analysis. *The Journal of the American Medical Association, 288*(6), 728-737.

Black, M. M., Walker, S. P., Fernald, L. C., Andersen, C. T., DiGirolamo, A. M., Lu, C., ... Shiffman, J. (2017). Advancing Early Childhood Development: From Science to Scale 1: Early childhood development coming of age: Science through the life course. *The Lancet, 389*(10064), 77.

Blencowe, H., Cousens, S., Jassir, F. B., Say, L., Chou, D., Mathers, C., ... You, D. (2016). National, regional, and worldwide estimates of stillbirth rates in 2015, with trends from 2000: A systematic analysis. *The Lancet Global Health, 4*(2), e98-e108.

Boulos, M. N. K., Brewer, A. C., Karimkhani, C., Buller, D. B., & Dellavalle, R. P. (2014). Mobile medical and health apps: state of the art, concerns, regulatory control, and certification. *Online Journal of Public Health Informatics, 5*(3), 229-252.

Boulos, M. N. K., Wheeler, S., Tavares, C., & Jones, R. (2011). How smartphones are changing the face of mobile and participatory healthcare: An overview, with example from eCAALYX. *Biomedical Engineering Online, 10*(1), 24-38.

Boyatzis, R. E. (1998). *Transforming qualitative information: Thematic analysis and code development*: Sage Publications. Case Western Reserve University, USA.

Braun, & Clarke. (2006). Using thematic analysis in psychology. *Qualitative Research in Psychology, 3*(2), 77-101.

Braun, Doernberg, N., Schieve, L., Christensen, D., Goodman, A., & Yeargin-Allsopp, M. (2016). Birth prevalence of cerebral palsy: A population-based study. *Pediatrics, 137*(1), e2015-2872.

Brink, L., Gebhardt, G., Mason, D., Groenewald, C., & Odendaal, H. (2019). The association between preterm labour, perinatal mortality and infant death (during the first year) in Bishop Lavis, Cape Town, South Africa. *South African Medical Journal, 109*(2), 102-106.

Brown, C. J., Gottschalk, M., Van Ness, P. H., Fortinsky, R. H., & Tinetti, M. E. (2005). Changes in physical therapy providers' use of fall prevention strategies following a multicomponent behavioral change intervention. *Physical Therapy, 85*(5), 394-403.

Brown, M. S., Ohlinger, J., Rusk, C., Delmore, P., & Ittmann, P. (2003). Implementing potentially better practices for multidisciplinary team building: Creating a neonatal intensive care unit culture of collaboration. *Pediatrics, 111*(Supplement E1), e482-e488.

Browne, J. V. (2011). Developmental care for high-risk newborns: Emerging science, clinical application, and continuity from newborn intensive care unit to community. *Clinics in Perinatology, 38*(4), 719-729.

Burnett, A., Anderson, P., Cheong, J., Doyle, L., Davey, C., & Wood, S. (2011). Prevalence of psychiatric diagnoses in preterm and full-term children, adolescents and young adults: A meta-analysis. *Psychological Medicine, 41*(12), 2463-2474.

Butler, M. L. (2018). *The self-reported perceptions of the multi-disciplinary team regarding standards of neurodevelopmental supportive care in the neonatal intensive care unit.* University of the Witwatersrand Unpublished Masters thesis.

Byers, J. F. (2003). Components of developmental care and the evidence for their use in the NICU. *The American Journal of Maternal/Child Nursing, 28*(3), 174-180.

Bruce, B., Letourneau, N., Ritchie, J., Larocque, S., Dennis, C., & Elliott, M. R. (2002). A multisite study of health professionals' perceptions and practices of family-centered care. *Journal of Family Nursing, 8*(4), 408-429.

Cameron, K. A. V., Ballantyne, S., Kulbitsky, A., Margolis-Gal, M., Daugherty, T., & Ludwig, F. (2005). Utilization of evidence-based practice by registered occupational therapists. *Occupational Therapy International, 12*(3), 123-136.

Carcary, M. (2009). The Research Audit Trial - Enhancing Trustworthiness in Qualitative Inquiry. *Electronic Journal of Business Research Methods, 7*(1).

Case-Smith, J., Allen, A. S., & Pratt, P. N. (1996). *Occupational therapy for children.* Mosby: St. Louis, USA.

CDC. (2019, September 23). *Causes and Risk Factors of Cerebral Palsy*. National Center on Birth Defects and Developmental Disabilities. Department of Health & Human Services. USA.

Chambers. (2015). Factors for sustainability of evidence-based practice innovations: Part I. *Research and Theory for Nursing Practice, 29*(2), 89-93.

Chambers, Glasgow, R. E., & Stange, K. C. (2013). The dynamic sustainability framework: addressing the paradox of sustainment amid ongoing change. *Implementation Science, 8*(1), 117.

Chard, G. (2006). Adopting the Assessment of Motor and Process Skills into practice: Therapists' voices. *British Journal of Occupational Therapy, 69*(2), 50-57.

Chen, P., & Hinton, S. M. (1999). Realtime interviewing using the world wide web. *Sociological Research Online, 4*(3), 63-81.

Cioni, G., & Sgandurra, G. (2013). Normal psychomotor development. In *Handbook of clinical neurology* (Vol. 111, pp. 3-15): Elsevier. Europe.

Clark, G. F., DEd, J. V. D., Radomski, M. V., Ruth Ramsey, M., Carol Siebert, M., Kristi Voelkerding, B., Deborah Lieberman, M. (2009). Guidelines for supervision, roles, and responsibilities during the delivery of occupational therapy services. *The American Journal of Occupational Therapy, 63*(6), 797.

Cochrane. (2005). Cochrane Collaboration on Effective Professional Practice. *The Cochrane Library.* John Wiley & Sons: Chichester, United Kingdom.

Cockburn, L., Fanfon, T. N., Bramall, A., Ngole, E. M., Kuwoh, P., Anjonga, E., ... Trivedi, N. (2014). Best practice guidelines for stroke in Cameroon: An innovative and participatory knowledge translation project. *African Journal of Disability, 3*(1).

Colquhoun, H. L., Letts, L. J., Law, M. C., MacDermid, J. C., & Missiuna, C. A. (2010). A scoping review of the use of theory in studies of knowledge translation. *Canadian Journal of Occupational Therapy, 77*(5), 270-279.

Cooper, P. J., Tomlinson, M., Swartz, L., Landman, M., Molteno, C., Stein, A., ... Murray, L. (2009). Improving quality of mother-infant relationship and infant attachment in socioeconomically deprived community in South Africa: Randomised controlled trial. *British Medical Journal, 338*.

Cooperrider, D. L., & Whitney, D. (2001). A positive revolution in change: Appreciative inquiry. *Public Administration and Public Policy, 87*, 611-630.

Copley, J. A., Turpin, M. J., & King, T. L. (2010). Information used by an expert paediatric occupational therapist when making clinical decisions. *Canadian Journal of Occupational Therapy, 77*(4), 249-256.

Craig, J. W., & Smith, C. R. (2020). Risk-adjusted/neuroprotective care services in the NICU: The elemental role of the neonatal therapist (OT, PT, SLP). *Journal of Perinatology, 40*(4), 549-559.

Cram, F. (2010). Appreciative inquiry. *Mai Review, 3*(1), 1-13.

Creswell, J. (2005). Educational research: Planning, conducting, and evaluating quantitative and qualitative research. Pearson Education: Upper Saddle River, NJ.

Creswell, J., & Creswell, J. (2017). *Research design: Qualitative, quantitative, and mixed methods approaches*: Sage Publications. United States.

Cusick, S., & Georgieff, M. K. (2016). *The first 1,000 days of life: the brain's window of opportunity.* Retrieved from: www.unicef-irc.org/article/958-the-first-1000-days-of-life-the-brainswindow-of-opportunity.html

Daniels, N., Gillen, P., Casson, K., & Wilson, I. (2019). STEER: Factors to consider when designing online focus groups using audiovisual technology in health research. *International Journal of Qualitative Methods, 18*.

Davanzo, R., Moro, G., Sandri, F., Agosti, M., Moretti, C., & Mosca, F. (2020). Breastfeeding and coronavirus disease-2019: Ad interim indications of the Italian Society of Neonatology endorsed by the Union of European Neonatal & Perinatal Societies. *Maternal & child nutrition, 16*(3), e13010.

Davis, D., Davis, M. E., Jadad, A., Perrier, L., Rath, D., Ryan, D., …Wowk, M. (2003). The case for knowledge translation: Shortening the journey from evidence to effect. *British Medical Journal, 327*(7405), 33-35.

Debelew, G. T., Afework, M. F., & Yalew, A. W. (2014). Determinants and causes of neonatal mortality in Jimma zone, southwest Ethiopia: A multilevel analysis of prospective follow up study. *Plos one, 9*(9), e107184.

DEd, J. V. D., COTA, J. J., Kathleen Kannenberg, M., Cherylin Lew, O., Youngstrom, M. J., & Deborah Lieberman, M. (2010). Standards of practice for occupational therapy. *The American Journal of Occupational Therapy, 64*(6), S106.

DeLany, J. V., Justice, J., Kannenberg, K., Lew, C., Youngstrom, M. J., & Lieberman, D. (2010). Standards of practice for occupational therapy. *The American Journal of Occupational Therapy, 64*(6), S106.

Denis, J.L., Hébert, Y., Langley, A., Lozeau, D., & Trottier, L.-H. (2002). Explaining diffusion patterns for complex health care innovations. *Health Care Management Review, 27*(3), 60-73.

Department of Health. (2017). *Maternal and Child Health.* Retrieved from: http://www.health.gov.za/index.php/gf-tb-program/113-maternal-and-child-health

Donald, K. A., Samia, P., Kakooza-Mwesige, A., & Bearden, D. (2014). *Pediatric cerebral palsy in Africa: A systematic review.* Paper presented at the Seminars in Pediatric Neurology, Hospital of Philidalphia.

Doyle, C., Howe, C., Woodcock, T., Myron, R., Phekoo, K., McNicholas, C., ... Bell, D. (2013). Making change last: Applying the NHS institute for innovation and improvement sustainability model to healthcare improvement. *Implementation Science, 8*(1), 1-10.

Dubouloz, C.-J., Egan, M., Vallerand, J., & von Zweck, C. (1999). Occupational therapists' perceptions of evidence-based practice. *American Journal of Occupational Therapy, 53*(5), 445-453.

Dysart, A. M., & Tomlin, G. S. (2002). Factors related to evidence-based practice among US occupational therapy clinicians. *American Journal of Occupational Therapy, 56*(3), 275-284.

Engle, P. L., Black, M. M., Behrman, J. R., De Mello, M. C., Gertler, P. J., Kapiriri, L., Group, I.C.D.S. (2007). Strategies to avoid the loss of developmental potential in more than 200 million children in the developing world. *The Lancet, 369*(9557), 229-242.

Ennion, L., & Rhoda, A. (2016). Roles and challenges of the multidisciplinary team involved in prosthetic rehabilitation, in a rural district in South Africa. *Journal of Multidisciplinary Healthcare, 9*, 565.

Erdeve, Ö., Atasay, B., Arsan, S., & Türmen, T. (2008). Effects of the hospitalization experience in the neonatal intensive care unit on the family and premature infant. *Journal of Child Health and Diseases, 51(2),* 104-109.

Escobedo, C., Guerrero, J., Lujan, G., Ramirez, A., & Serrano, D. (2007). Ethical issues with informed consent. *Elizabeth Zubiate, 8*, 1-44.

Esteves, D., Pinheiro, P., Brás, R., Rodrigues, R., & O'Hara, K. (2010). *Identifying knowledge transfer problems from sport science to coach practice.* Paper presented at the Proceedings of the 11th European Conference of Knowledge Management, Europe.

Etikan, I., Musa, S. A., & Alkassim, R. S. (2016). Comparison of convenience sampling and purposive sampling. *American Journal of Theoretical and Applied Statistics, 5*(1), 1-4.

Fereday, J., & Muir-Cochrane, E. (2006). Demonstrating rigor using thematic analysis: A hybrid approach of inductive and deductive coding and theme development. *International Journal of Qualitative Methods, 5*(1), 80-92.

Finlayson, M., Shevil, E., Mathiowetz, V., & Matuska, K. (2005). Reflections of occupational therapists working as members of a research team. *Australian Occupational Therapy Journal, 52*(2), 101-108.

Flicker, S., & Nixon, S. A. (2015). The DEPICT model for participatory qualitative health promotion research analysis piloted in Canada, Zambia and South Africa. *Health Promotion International, 30*(3), 616-624.

Funabashi, M., Warren, S., & Kawchuk, G. N. (2012). Knowledge exchange and knowledge translation in physical therapy and manual therapy fields: Barriers, facilitators and issues. *Physical Therapy Reviews, 17*(4), 227-233.

Gagliardi, A. R., Berta, W., Kothari, A., Boyko, J., & Urquhart, R. (2015). Integrated knowledge translation (IKT) in health care: A scoping review. *Implementation Science, 11*(1), 38.

Gagliardi, A. R., & Dobrow, M. J. (2016). Identifying the conditions needed for integrated knowledge translation (IKT) in health care organizations: Qualitative interviews with researchers and research users. *British Medical Council Health Services Research, 16*(1), 256.

Gauchan, E., DP, B. S. K., & Rao, K. (2012). Clinical profile and outcome of babies admitted to Neonatal Intensive Care Unit (NICU). *Journal of Institute of Medicine*, 33(2).

George, M., & Apter, A. J. (2004). Gaining insight into patients' beliefs using qualitative research methodologies. *Current Opinion in Allergy and Clinical Immunology, 4*(3), 185-189.

Gillon, R. (1985). " It's all too subjective": Scepticism about the possibility or use of philosophical medical ethics. *British Medical Journal (Clinical research ed.), 290*(6481), 1574.

Glasgow, R. E., Lichtenstein, E., & Marcus, A. C. (2003). Why don't we see more translation of health promotion research to practice? Rethinking the efficacy-to-effectiveness transition. *American Journal of Public Health, 93*(8), 1261-1267.

Goldstein, R. F. (2012). Developmental care for premature infants: A state of mind. *Pediatrics, 129*(5), e1322-e1323.

Gorga. (1994). The evolution of occupational therapy practice for infants in the neonatal intensive care unit. *American Journal of Occupational Therapy, 48*(6), 487-489.

Gorga, D., Anzalone, M., Holloway, E., Hunter, J., Munsickbruno, G., & Chandler, B. (1993). Knowledge and skills for Occupational therapy practice in the Neontal Intensive Care. *American Journal of Occupational Therapy, 47*(12), 1100-1105.

Graham. (2005). Illustrating triangulation in mixed-methods nursing research. *Nurse Researcher, 12*(4), 7-18.

Graham, Logan, J., Harrison, M. B., Straus, S. E., Tetroe, J., Caswell, W., & Robinson, N. (2006). Lost in knowledge translation: Time for a map? *Journal of Continuing Education in the Health Professions, 26*(1), 13-24.

Graham, & Tetroe, J. (2007). How to translate health research knowledge into effective healthcare action. *Healthc Quarterly.10*(3), 20-22.

Graham, Tetroe, J., Robinson, N., & Grimshaw, J. (2005). *An international study of health research funding agencies' support and promotion of knowledge translation.* Paper presented at the Academy Health Annual Research Meeting, Boston, 125-155.

Graneheim, U. H., & Lundman, B. (2004). Qualitative content analysis in nursing research: Concepts, procedures and measures to achieve trustworthiness. *Nurse Education Today, 24*(2), 105-112.

Grantham-McGregor, S., Cheung, Y. B., Cueto, S., Glewwe, P., Richter, L., Strupp, B., & Group, I. C. D. S. (2007). Developmental potential in the first 5 years for children in developing countries. *The Lancet, 369*(9555), 60-70.

Graven, S. N. (2000). Sound and the developing infant in the NICU: Conclusions and recommendations for care. *Journal of Perinatology, 20*(1), S88-S93.

Green, L., Gorenflo, D. W., & Wyszewianski, L. (2002). Validating an instrument for selecting interventions to change physician practice patterns. *Journal of Family Practice, 51*(11), 938-942.

Griffiths, N., Spence, K., Loughran-Fowlds, A., & Westrup, B. (2019). Individualised developmental care for babies and parents in the NICU: Evidence-based best practice guideline recommendations. *Early Human Development, 139*, 104840.

Griggs, D., Stafford-Smith, M., Gaffney, O., Rockström, J., Öhman, M. C., Shyamsundar, P., ... Noble, I. (2013). Policy: Sustainable development goals for people and planet. *Nature, 495*(7441), 305.

Grimshaw, Shirran, L., Thomas, R., Mowatt, G., Fraser, C., Bero, L., ... O'Brien, M. A. (2001). Changing provider behavior: An overview of systematic reviews of interventions. *Medical Care*, II2-II45.

Grimshaw, Thomas, R., MacLennan, G., Fraser, C., Ramsay, C., Vale, L., Shirran, L. (2004). Effectiveness and efficiency of guideline dissemination and implementation strategies. *International Journal of Technology Assessment in Health Care*, *21*(1), 149-149.

Grol, R. (2001). Successes and failures in the implementation of evidence-based guidelines for clinical practice. *Medical Care*, *39*(8 Suppl 2), II46-54.

Grossoehme, D. H. (2014). Overview of qualitative research. *Journal of Health Care Chaplaincy, 20*(3), 109-122.

Guest, G., Bunce, A., & Johnson, L. (2006). How many interviews are enough? An experiment with data saturation and variability. *Field Methods, 18*(1), 59-82.

Hardy, M., Govender, P., & Naidoo, D. (2020). Novice Occupational therapists experiences of working in neonatal intensive care units in KZN. *South African Journal of Occupational Therapy (In review)*.

Hayward, R. S., Wilson, M. C., Tunis, S. R., Bass, E. B., & Guyatt, G. (1995). Users' Guides to the Medical Literature: VIII. How to Use Clinical Practice Guidelines A. Are the Recommendations Valid? The Evidence-Based Medicine Working Group. *The Journal of the American Medical Association, 274*(7), 570-574.

Heale, R., & Forbes, D. (2013). Understanding triangulation in research. *Evidence-Based Nursing, 16*(4), 98-98.

Health Professions Act. (1974) ACT No. 56 OF 1974: Regulations defining the scope of the profession of occupational therapy. Health Professions Council of South Africa. Pretoria.

Health Professions Act. (2011). ACT No. 56 of 1974: Regulations relating to performance of community service by persons registering in terms of the health professions act. Health Professions Council of South Africa. Pretoria.

Hinchliffe, S. R., Seaton, S. E., Lambert, P. C., Draper, E. S., Field, D. J., & Manktelow, B. N. (2013). Modelling time to death or discharge in neonatal care: An application of competing risks. *Paediatric and Perinatal Epidemiology, 27*(4), 426-433.

Hockenberry, M. J., & Wilson, D. (2018). *Wong's nursing care of infants and children-E-book*: Elsevier Health Sciences. United States.

Hocking, C., & Ness, N. E. (2016). Introduction to the revised minimum standards for the education of occupational therapists—2016. [2016]. *World Federation of Occupational Therapists Bulletin, 46*(1), 29-45.

Hodgetts, S., Hollis, V., Triska, O., Dennis, S., Madill, H., & Taylor, E. (2007). Occupational therapy students' and graduates' satisfaction with professional education and preparedness for practice. *Canadian Journal of Occupational Therapy, 74*(3), 148-160.

Hoque, M., Haaq, S., & Islam, R. (2011). Causes of neonatal admissions and deaths at a rural hospital in KwaZulu-Natal, South Africa. *Southern African Journal of Epidemiology and Infection, 26*(1), 26-29.

HPCSA (2000). Ethical guidelines for good practice in the health care professions. Health Professions Council of South Africa.

HPCSA (2019). The Minimum Standards for the Training of Occupational Therapists. Health Professions Council of South Africa.

Hug, L., Sharrow, D., & You, D. (2019). *Levels & Trends in Child Mortality* Retrieved from UNICEF headquarters: https://www.unicef.org/media/60561/file/UN-IGME-child-mortality-report-2019.pdf.

Humphris, D., Littlejohns, P., Victor, C., O'halloran, P., & Peacock, J. (2000). Implementing evidence-based practice: Factors that influence the use of research evidence by occupational therapists. *British Journal of Occupational Therapy, 63*(11), 516-522.

Hungler, B. P., Beck, C., & Polit, D. (1997). *Essentials of nursing research: methods, appraisal, and utilization*: Lippincott-Raven. Austrailia.

Hunter. (1996). Clinical interpretation of “education and training of occupational therapists for neonatal intensive care units”. *American Journal of Occupational Therapy, 50*(7), 495-503.

Hunter, Lee, & Altimier. (2015). *Neonatal Intensive Care Units*. *Occupational Therapy for Children and Adolescents*. 595-635.

Hurley, M. (2000). Linking research with practice: the missing link–collaboration. *Physiotherapy, 86*(7), 339-341.

Hutchinson, S. W., Spillet, M. A., & Cronin, M. (2012). Parents' Experiences during Their Infant's Transition from Neonatal Intensive Care Unit to Home: A Qualitative Study. *Qualitative Report, 17*, 23.

Hwang, A.-W., Chao, M.-Y., & Liu, S.-W. (2013). A randomized controlled trial of routines-based early intervention for children with or at risk for developmental delay. *Research in Developmental Disabilities, 34*(10), 3112-3123.

Israel, M., & Hay, I. (2006). *Research ethics for social scientists*: Sage Publications: Washington USA.

Jacobs, L., Cateleijn, D., & Lubbe, W. (2018). *Neurodevelopmental supportive care in South African NICUs - an essential change of attitude*. Paper presented at the World Federation of Occupational Therapists (WFOT), George Western Cape. Retrieved from: https://congress2018.wfot.org/downloads/presentations/SE77/lizelle_jacobs.pdf

Jacobson, N., Butterill, D., & Goering, P. (2003). Development of a framework for knowledge translation: Understanding user context. *Journal of Health Services Research and Policy, 8*(2), 94-99.

Jette, D. U., Bacon, K., Batty, C., Carlson, M., Ferland, A., Hemingway, R. D., ... Volk, D. (2003). Evidence-based practice: Beliefs, attitudes, knowledge, and behaviors of physical therapists. *Physical Therapy, 83*(9), 786-805.

Jobe, A. H. (2014). A risk of sensory deprivation in the neonatal intensive care unit. *The Journal of Pediatrics, 164*(6), 1265-1267.

Johnson, S., & Marlow, N. (2011). Preterm birth and childhood psychiatric disorders. *Pediatric Research, 69*(8), 11-18.

Jones, Roop, S. C., Pohar, S. L., Albrecht, L., & Scott, S. D. (2015). Translating knowledge in rehabilitation: Systematic review. *Physical Therapy, 95*(4), 663-677.

Jones, R. J., & Santaguida, P. (2005). Evidence-based practice and health policy development: The link between knowledge and action. *Physiotherapy, 91*(1), 14-21.

Kardaş Özdemir, F., & Güdücü Tüfekci, F. (2014). The effect of individualised developmental care practices on the growth and hospitalisation duration of premature infants: The effect of mother's scent and flexion position. *Journal of Clinical Nursing, 23*(21-22), 3036-3044.

Karlsson, U., & Törnquist, K. (2007). What do Swedish occupational therapists feel about research? A survey of perceptions, attitudes, intentions, and engagement. *Scandinavian Journal of Occupational Therapy, 14*(4), 221-229.

Kastner, M., Tricco, A. C., Soobiah, C., Lillie, E., Perrier, L., Horsley, T., ... Straus, S. E. (2012). What is the most appropriate knowledge synthesis method to conduct a review? Protocol for a scoping review. *British Medical Council Medical Research Methodology, 12*(1), 114.

Kenner, C., & McGrath, J. (2004). *Developmental care of newborns & infants: A guide for health professionals*: Mosby Incorporated. United States.

Khanna, V., Sambandam, S. N., Gul, A., & Mounasamy, V. (2015). “WhatsApp”ening in orthopedic care: A concise report from a 300-bedded tertiary care teaching center. *European Journal of Orthopaedic Surgery and Traumatology, 25*(5), 821-826.

King, G., Strachan, D., Tucker, M., Duwyn, B., Desserud, S., & Shillington, M. (2009). The application of a transdisciplinary model for early intervention services. *Infants and Young Children, 22*(3), 211-223.

Kite, J., & Phongsavan, P. (2017). Insights for conducting real-time focus groups online using a web conferencing service. *F1000 Research, 6*(122), 122.

Knippenberg, R., Lawn, J. E., Darmstadt, G. L., Begkoyian, G., Fogstad, H., Walelign, N., … Team, L. N. S. S. (2005). Systematic scaling up of neonatal care in countries. *The Lancet, 365*(9464), 1087-1098.

Koch, T. (1994). Establishing rigour in qualitative research: the decision trail. *Journal of Advanced Nursing, 19*(5), 976-986.

Kohli, T. (1990). Impact of home-centre based training programme in reducing developmental deficiencies of disadvantaged children. *Indian Journal of Disability & Rehabilitation*. *4*(2), 65–74.

Korner-Bitensky, N., Wood-Dauphinee, S., Teasell, R., Desrosiers, J., Malouin, F., Thomas, A., ... Kehayia, E. (2006). Best versus Actual Practices in Stroke Rehabilitation: Results of the Canadian National Survey: 57. *Stroke, 37*(2), 623– 634.

Kothari, A., & Wathen, C. N. (2013). A critical second look at integrated knowledge translation. *Health Policy, 109*(2), 187-191.

KwaZulu-Natal Occupational Therapy Forum. (2019a). *Annual Provincial Report.* KwaZulu-Natal Department of Health: Pietermaritzburg.

KwaZulu-Natal Occupational Therapy Forum. (2019b). *HR Staffing*. KwaZulu-Natal Department of Health: Pietermaritzburg.

Lapaige, V. (2010). “Integrated knowledge translation” for globally oriented public health practitioners and scientists: Framing together a sustainable transfrontier knowledge translation vision. *Journal of Multidisciplinary Healthcare, 3*, 33.

Laudert, S., Liu, W., Blackington, S., Perkins, B., Martin, S., MacMillan-York, E., ... Handyside, J. (2007). Implementing potentially better practices to support the neurodevelopment of infants in the NICU. *Journal of Perinatology, 27*(2), S75-S93.

Lawn, J. E., Cousens, S., Zupan, J., & Team, L. N. S. S. (2005). 4 million neonatal deaths: when? Where? Why? *The Lancet, 365*(9462), 891-900.

Lawn, J. E., Kerber, K., Enweronu-Laryea, C., & Cousens, S. (2010). *3.6 million neonatal deaths—what is progressing and what is not?* Paper presented at the Seminars in perinatology. 34. 371-86. 10.1053/j.semperi.2010.09.011.

Lecuona, E. R., Raubenheimer, J., van Heerden, R., & van Jaarsveld, A. (2016). The developmental status and prevalence of sensory integration difficulties in premature infants in a tertiary hospital in Bloemfontein, South Africa. *South African Journal of Occupational Therapy, 46*(1), 15-19.

Legendre, V., Burtner, P. A., Martinez, K. L., & Crowe, T. K. (2011). The evolving practice of developmental care in the neonatal unit: A systematic review. *Physical and Occupational Therapy in Pediatrics, 31*(3), 315-338.

Lekskulchai, R., & Cole, J. (2001). Effect of a developmental program on motor performance in infants born preterm. *Australian Journal of Physiotherapy, 47*(3), 169-176.

LINC. (2012). *Limpopo Initiative for Newborn Care.* Retrieved from: http://www.lincare.co.za/?page_id=1017

Lissauer, T., & Carroll, W. (2017). *Illustrated textbook of paediatrics*. Elsevier Health Sciences. Britain.

Lloyd, L. G., & De Witt, T. (2013). Neonatal mortality in South Africa: How are we doing and can we do better? *South African Medical Journal, 103*(8), 518-519.

Lobe, B. (2017). Best Practices for Synchronous Online Focus Groups. In *A New Era in Focus Group Research* (pp. 227-250): Springer. Palgrave Macmillan, London.

Lobe, B., Morgan, D., & Hoffman, K. A. (2020). Qualitative Data Collection in an Era of Social Distancing. *International Journal of Qualitative Methods, 19*. 1-8.

Logan, J., & Graham, I. D. (1998). Toward a comprehensive interdisciplinary model of health care research use. *Science Communication, 20*(2), 227-246.

Lohr, K. N., & Steinwachs, D. M. (2002). Health services research: An evolving definition of the field. *Health Services Research, 37*(1), 15.

Lubbe, W. (2010). *Best practice guidelines for neurodevelopmental supportive care of the preterm infant.* North-West University: South Africa.

Lubbe, W., Van der Walt, C. S., & Klopper, H. C. (2012). Integrative literature review defining evidence-based neurodevelopmental supportive care of the preterm infant. *The Journal of Perinatal and Neonatal Nursing, 26*(3), 251-259.

Ludema, J. D., Cooperrider, D. L., & Barrett, F. J. (2006). Appreciative inquiry: The power of the unconditional positive question. *Handbook of Action Research: Concise Paperback Edition*, 155-165. SAGE Publications. University of Benedictine.

Lundberg, C. C. (2003). Research design: Qualitative, quantitative and mixed methods approaches. *Organizational Research Methods, 6*(3), 404.

Lyons, C., Casey, J., Brown, T., Tseng, M., & McDonald, R. (2010). Research knowledge, attitudes, practices and barriers among paediatric occupational therapists in the United Kingdom. *British Journal of Occupational Therapy, 73*(5), 200-209.

MacDermid, J. C., & Graham, I. D. (2009). Knowledge translation: Putting the “practice” in evidence-based practice. *Hand Clinics, 25*(1), 125-143.

Macho, P., & Zukowsky, K. (2017). Individualized developmental care in the NICU. *Advances in Neonatal Care, 17*(3), 162-174.

MacWalter, G., McKay, J., & Bowie, P. (2016). Utilisation of internet resources for continuing professional development: A cross-sectional survey of general practitioners in Scotland. *British Medical Council Medical Education, 16*(1), 24.

Maharaj, S. S. (2013). Mandatory continuing professional development in South Africa: Rehabilitation therapists' perspective. *International Journal of Therapy and Rehabilitation, 20*(7), 343-351.

Mahoney, A. D., White, R. D., Velasquez, A., Barrett, T. S., Clark, R. H., & Ahmad, K. A. (2020). Impact of restrictions on parental presence in neonatal intensive care units related to coronavirus disease 2019. *Journal of Perinatology, 40*(1), 36-46.

Malone, H., Nicholl, H., & Tracey, C. (2014). Awareness and minimisation of systematic bias in research. *British Journal of Nursing, 23*(5), 279-282.

Maluleke, R. (2016). *Profiling socio economic status and living arrangement of persons with disabilities in South Africa*. Retrieved from: http://cs2016.statssa.gov.za/wp-content/uploads/2018/07/CS-2016-Disability-Report_-03-01-232016.pdf.

March of Dimes. (2013). *Prematurity Campaign.* Retrieved from: http://www.marchofdimes.com/mission/prematurity_indepth.html

Mars, M., & Scott, R. (2016). WhatsApp telemedicine a growing field: A literature review—South Africa as a case study. eLearning and Health ICT Education. *Global Telemedicine and eHealth Updates: Knowledge Resources., 9*, 191-195.

Matthews, K. L., Baird, M., & Duchesne, G. (2018). Using online meeting software to facilitate geographically dispersed focus groups for health workforce research. *Qualitative Health Research, 28*(10), 1621-1628.

McCluskey, A. (2003). Occupational therapists report a low level of knowledge, skill and involvement in evidence-based practice. *Australian Occupational Therapy Journal, 50*(1), 3-12.

McCormick, M. C., Litt, J. S., Smith, V. C., & Zupancic, J. A. (2011). Prematurity: An overview and public health implications. *Annual Review of Public Health, 32*, 367-379.

McGlynn, E. A., Asch, S. M., Adams, J., Keesey, J., Hicks, J., DeCristofaro, A., & Kerr, E. A. (2003). The quality of health care delivered to adults in the United States. *New England Journal of Medicine, 348*(26), 2635-2645.

McKenna, K., Bennett, S., Dierselhuis, Z., Hoffmann, T., Tooth, L., & McCluskey, A. (2005). Australian occupational therapists' use of an online evidence-based practice database (OTseeker). *Health Information and Libraries Journal, 22*(3), 205-214.

McKenzie, A. S. (2003). Change from Within. *American School Board Journal, 190*(7), 37-38.

McQueen, J. (2008). Practice development: Bridging the research-practice divide through the appointment of a research lead. *British Journal of Occupational Therapy, 71*(3), 112-118.

McQueen, J., Nivison, C., Husband, V., & Miller, C. (2006). An investigation into the use of a journal club for evidence-based practice. *International Journal of Therapy and Rehabilitation, 13*(7), 311-317.

Menon, A., Korner-Bitensky, N., Kastner, M., McKibbon, K., & Straus, S. (2009). Strategies for rehabilitation professionals to move evidence-based knowledge into practice: A systematic review. *Journal of Rehabilitation Medicine, 41*(13), 1024-1032.

Metcalfe, C., Lewin, R., Wisher, S., Perry, S., Bannigan, K., & Moffett, J. K. (2001). Barriers to implementing the evidence base in four NHS therapies: Dietitians, occupational therapists, physiotherapists, speech and language therapists. *Physiotherapy, 87*(8), 433-441.

Miles, M. B., & Huberman, A. M. (1994). *Qualitative data analysis: An expanded sourcebook*: Sage Publications. United States.

Miller, G. E. (1990). The assessment of clinical skills/competence/performance. *Academic Medicine, 65*(9), S63-67.

Mitton, C., Adair, C. E., McKenzie, E., Patten, S. B., & Perry, B. W. (2007). Knowledge transfer and exchange: Review and synthesis of the literature. *The Milbank Quarterly, 85*(4), 729-768.

Moher, D., Glasziou, P., Chalmers, I., Nasser, M., Bossuyt, P. M., Korevaar, D. A., ... Boutron, I. (2016). Increasing value and reducing waste in biomedical research: Who's listening? *The Lancet, 387*(10027), 1573-1586.

Müller, M., Myburgh, A., & Stock, R. (2016). *The Training and Role of Occupational Therapists in South African Neonatal Intensive Care Units.* University of the Witwatersrand Faculty of Health Sciences, School of Therapeutic Sciences. Johannesburg.

Murphy, L. B. (1993). The demands of beneficence. *Philosophy and Public Affairs*, 267-292.

Mwaniki, M. K., Atieno, M., Lawn, J. E., & Newton, C. R. (2012). Long-term neurodevelopmental outcomes after intrauterine and neonatal insults: A systematic review. *The Lancet, 379*(9814), 445-452.

Nair, M., Gupta, G., & Jatana, S. (2003). NICU environment: Can we be ignorant? *Medical Journal, Armed Forces India, 59*(2), 93.

Nannan, N., Groenewald, P., Pillay-van Wyk, V., Nicol, E., Msemburi, W., Dorrington, R., & Bradshaw, D. (2019). Child mortality trends and causes of death in South Africa, 1997-2012, and the importance of a national burden of disease study. *South African Medical Journal, 109*(7), 480-485.

Nardo, B., Cannistrà, M., Diaco, V., Naso, A., Novello, M., Zullo, A., ... Sacco, R. (2016). Optimizing patient surgical management using WhatsApp application in the Italian healthcare system. *Telemedicine and e-Health, 22*(9), 718-725.

National Association of Neonatal Therapists. (2014). *Neonatal therapy core scope of practice*. Retrieved from: https://neonataltherapists.com/resources/

National Center for Dissemination of Disability Research. (2005). What is knowledge translation? *Technical brief number 10.* Retrieved from: http://www.ncddr.org/du/products/focus/focus

Nightlinger, K. (2011). Developmentally supportive care in the neonatal intensive care unit: An occupational therapist's role. *Neonatal Network, 30*(4), 243-248.

Noble, L. (2003). Developments in neonatal technology continue to improve infant outcomes. *Pediatric Annals, 32*(9), 595-603.

Novak, I., Mcintyre, S., Morgan, C., Campbell, L., Dark, L., Morton, N., ... Goldsmith, S. (2013). A systematic review of interventions for children with cerebral palsy: State of the evidence. *Developmental Medicine and Child Neurology, 55*(10), 885-910.

Nowell, L. S., Norris, J. M., White, D. E., & Moules, N. J. (2017). Thematic analysis: Striving to meet the trustworthiness criteria. *International Journal of Qualitative Methods, 16*(1), 1-13.

Oborn, E., Barrett, M., Prince, K., & Racko, G. (2013). Balancing exploration and exploitation in transferring research into practice: A comparison of five knowledge translation entity archetypes. *Implementation Science, 8*(1), 104.

Oestergaard, M. Z., Inoue, M., Yoshida, S., Mahanani, W. R., Gore, F. M., Cousens, S., ... Mathers, C. D. (2011). Neonatal mortality levels for 193 countries in 2009 with trends since 1990: A systematic analysis of progress, projections, and priorities. *PLoS Medicine, 8*(8).

Olson, J. A., & Baltman, K. (1994). Infant mental health in occupational therapy practice in the neonatal intensive care unit. *American Journal of Occupational Therapy, 48*(6), 499-505.

Olusanya, B. O., Davis, A. C., Wertlieb, D., Boo, N.-Y., Nair, M., Halpern, R., ... Gladstone, M. (2018). Developmental disabilities among children younger than 5 years in 195 countries and territories, 1990–2016: A systematic analysis for the Global Burden of Disease Study 2016. *The Lancet Global Health, 6*(10), e1100-e1121.

Orton, J. L., Olsen, J. E., Ong, K., Lester, R., & Spittle, A. J. (2018). NICU graduates: The role of the allied health team in follow-up. *Pediatric annals, 47*(4), e165-e171.

Pain, K., Magill-Evans, J., Darrah, J., Hagler, P., & Warren, S. (2004). Effects of profession and facility type on research utilization by rehabilitation professionals. *Journal of Allied Health, 33*(1), 3-9.

Patton, M. Q. (1999). Enhancing the quality and credibility of qualitative analysis. *Health Services Research, 34*(5 Pt 2), 1189.

Petzold, A., Korner-Bitensky, N., Salbach, N. M., Ahmed, S., Menon, A., & Ogourtsova, T. (2012). Increasing knowledge of best practices for occupational therapists treating post-stroke unilateral spatial neglect: results of a knowledge-translation intervention study. *Journal of Rehabilitation Medicine, 44*(2), 118-124.

Phatak, P. (2000). Early stimulation of infants with risks for development. *Psychological Studies, 45*(1/2), 83-86.

Philibert, D. B., Snyder, P., Judd, D., & Windsor, M.-M. (2003). Practitioners' reading patterns, attitudes, and use of research reported in occupational therapy journals. *American Journal of Occupational Therapy, 57*(4), 450-458.

Pietkiewicz, I., & Smith, J. A. (2012). A practical guide to interpretative phenomenological analysis in qualitative research in psychology. Psychological Journal, 18 (2), 361-369.

Pitney, W. A. (2004). Strategies for establishing trustworthiness in qualitative research. *International Journal of Athletic Therapy and Training, 9*(1), 26-28.

Podsakoff, P. M., MacKenzie, S. B., Lee, J.-Y., & Podsakoff, N. P. (2003). Common method biases in behavioral research: A critical review of the literature and recommended remedies. *Journal of Applied Psychology, 88*(5), 879.

Poitras, S., Durand, M.-J., Côté, A.-M., & Tousignant, M. (2011). Use of low-back pain guidelines by occupational therapists: A qualitative study of barriers and facilitators. *Work, 39*(4), 465-475.

Proctor, E., Luke, D., Calhoun, A., McMillen, C., Brownson, R., McCrary, S., & Padek, M. (2015). Sustainability of evidence-based healthcare: Research agenda, methodological advances, and infrastructure support. *Implementation Science, 10*(1), 88.

Province of KwaZulu-Natal. (2016, 2 August 2017). Socio-economic Review and Outlook 2015/2016. Retrieved from: http://www.kzntreasury.gov.za/Socio%20Economic/SERO_FINAL_4_March_2016.pdf

Puopolo, K., Mark, L., Hudak, M., Kimberlin, D., & Cummings, J. (2020). Management of infants born to mothers with COVID-19. Retrieved from https://services.aap.org/en/pages/2019-novel-coronavirus-covid-19-infections/clinical-guidance/faqs-management-of-infants-born-to-covid-19-mothers/

Rabinovich, G., Goldenberg, N., Harel, M., Sharon, G., Boni, O., & Tzarfati, O. (2018). Occupational Therapy Intervention in Neonatal Intensive Care Units: Position Paper. *The Israeli Society of Occupational Therapy*, 2.

Rakhetla, M. M. E. (2015). *Factors influencing implementation strategies regarding environmental design in neonatal intensive care units.* North-West University: South Africa.

Ramachandran, S., & Dutta, S. (2013). Early developmental care interventions of preterm very low birth weight infants. *Indian Pediatrics, 50*(8), 765-770.

Rappolt, S., & Tassone, M. (2002). How rehabilitation therapists gather, evaluate, and implement new knowledge. *Journal of Continuing Education in the Health Professions, 22*(3), 170-180.

Rebbeck, T., Maher, C. G., & Refshauge, K. M. (2006). Evaluating two implementation strategies for whiplash guidelines in physiotherapy: a cluster-randomised trial. *Australian Journal of Physiotherapy, 52*(3), 165.

Rheeder, A., Lubbe, W., & Pretorius, R. (2017). Compliance with Best Practice Guidelines for Neurodevelopmental Supportive Care in South Africa: A Situational Analysis. *The Journal of Perinatal and Neonatal Nursing, DOI: 10.1097/jpn.0000000000000275.*

Rhoda, N., Velaphi, S., Gebhardt, G., Kauchali, S., & Barron, P. (2018). Reducing neonatal deaths in South Africa: Progress and challenges. *South African Medical Journal, 108*(3), 9-16.

Richardson, J., & Rugg, S. (2006). Changing practice speciality in occupational therapy: Exploring the experience. Part one. *International Journal of Therapy and Rehabilitation, 13*(10), 443-447.

Richter, L., Black, M., Britto, P., Daelmans, B., Desmond, C., Devercelli, A., ... Lombardi, J. (2019). Early childhood development: An imperative for action and measurement at scale. *British Medical Journal Global Health, 4*(Suppl 4), e001302.

Robertson, D. M. (2012). *Critical thinking and clinical reasoning in new graduate occupational therapists: A phenomenological study.* Robert Gordon University, PhD thesis.

Robinson, J. E. (2000). Access to employment for people with disabilities: Findings of a consumer-led project. *Disability and Rehabilitation, 22*(5), 246-253.

Rocco, T. S., & Plakhotnik, M. S. (2009). Literature reviews, conceptual frameworks, and theoretical frameworks: Terms, functions, and distinctions. *Human Resource Development Review, 8*(1), 120-130.

Rogers, Martin, F. H., & Force, N. K. T. T. (2009). Knowledge translation in disability and rehabilitation research: Lessons from the application of knowledge value mapping to the case of accessible currency. *Journal of Disability Policy Studies, 20*(2), 110-126.

Rogers, E. M. (2010). *Diffusion of innovations*: Simon and Schuster: United States.

Roley, S., Delany, J. V., Barrows, C., Honaker, D., Sava, D., & Talley, V. (2008). Occupational therapy practice framework: Domain and process. *American Journal of Occupational Therapy, 62*(6).

Ross, S., Lavis, J., Rodriguez, C., Woodside, J., & Denis, J. L. (2003). Partnership experiences: Involving decision-makers in the research process. *Journal of Health Services Research and Policy, 8*(Suppl. 2), 26-34.

Royal College of Obstetricians & Gynaecologists. (2020). National guidance on managing coronavirus infection in pregnancy Retrieved from https://www.rcog.org.uk/en/news/national-guidance-on-managing-coronavirus-infection-in-pregnancy-published/

Royal College of Occupational Therapists. (2017). Occupational therapy in neonatal services and early intervention. *Practice guideline*, 1-52. Retrieved from: https://www.rcot.co.uk/practice-resources/rcot-publications/downloads/neonatal-services

Ruggles, R. (2009). *Knowledge management tools*: Routledge: Taylor and Francis Group.

Saldaña, J. (2009). First cycle coding methods. *The coding manual for qualitative researchers*, 45-148. Sage Publications: London, UK.

Salls, J., Dolhi, C., Silverman, L., & Hansen, M. (2009). The use of evidence-based practice by occupational therapists. *Occupational Therapy in Health Care, 23*(2), 134-145.

SASLHA. (2011). Guidelines: Early Communication Intervention, *Ethics and Standards Committee,* Retrieved from: https://www.mm3admin.co.za/documents/docmanager/55e836d5-3332-4452-bb05-9f12be8da9d8/00012503.pdf

Salvatore, C. M., Han, J.-Y., Acker, K. P., Tiwari, P., Jin, J., Brandler, M., DiPace, J. (2020). Neonatal management and outcomes during the COVID-19 pandemic: an observation cohort study. *The Lancet Child & Adolescent Health, 4*(10), 721-727.

Scheirer, M. A. (2005). Is sustainability possible? A review and commentary on empirical studies of program sustainability. *American Journal of Evaluation, 26*(3), 320-347.

Schuster, M. A., McGlynn, E. A., & Brook, R. H. (1998). How good is the quality of health care in the United States? *The Milbank Quarterly, 76*(4), 517-563.

Scott, S. D., Albrecht, L., O'Leary, K., Ball, G. D., Hartling, L., Hofmeyer, A., ... Newton, A. S. (2012). Systematic review of knowledge translation strategies in the allied health professions. *Implementation Science, 7*(1), 70.

Seedat, J. (2013). *Knowledge translation in dysphagia: a South African study (Doctoral Disseration).*

Sellier, E., Platt, M. J., Andersen, G. L., Krägeloh-Mann, I., De La Cruz, J., Cans, C., ... Delobel, M. (2016). Decreasing prevalence in cerebral palsy: A multi-site European population-based study, 1980 to 2003. *Developmental Medicine and Child Neurology, 58*(1), 85-92.

Sharoff, L. (2011). Integrating YouTube into the nursing curriculum. *OJIN: The Online Journal of Issues in Nursing, 16*(3), 1-6.

Shepley, M. M. (2004). Evidence-based design for infants and staff in the neonatal intensive care unit. *Clinics in Perinatology, 31*(2), 299-311.

Sherry, K. (2014). Disability and rehabilitation: Essential considerations for equitable, accessible and poverty-reducing health care in South Africa. *South African Health Review, 2014*(1), 89-99.

Shevell, M., Dagenais, L., & Oskoui, M. (2013). *The epidemiology of cerebral palsy: New perspectives from a Canadian registry.* Paper presented at the Seminars in pediatric neurology, Canada.

Shung-King, M., Lake, L., Sanders, D., & Hendricks, M. E. (2019). *Child and adolescent health: Leave no one behind.* Children's Institute: Cape Town.

Silverman, D. (2016). *Qualitative research*. Sage Publications: United States.

Smith, J. G., Desai, P. P., Sira, N., & Engelke, S. C. (2014). Family-centered developmentally supportive care in the neonatal intensive care unit: Exploring the role and training of child life specialists. *Children's Health Care, 43*(4), 345-368.

Smithers-Sheedy, H., McIntyre, S., Gibson, C., Meehan, E., Scott, H., Goldsmith, S., ... Novak, I. (2016). A special supplement: findings from the Australian Cerebral Palsy Register, birth years 1993 to 2006. *Developmental Medicine and Child Neurology, 58*, 5-10.

Spittle, A., Orton, J., Anderson, P. J., Boyd, R., & Doyle, L. W. (2015). Early developmental intervention programmes provided post hospital discharge to prevent motor and cognitive impairment in preterm infants. *Cochrane Database of Systematic Reviews*, 11.

Statistics South Africa. (2014). *Census 2011: Profile of persons with disabilities in South Africa.* Statistics SA: Pretoria.

Stevenson, K., Lewis, M., & Hay, E. (2004). Do physiotherapists' attitudes towards evidence-based practice change as a result of an evidence-based educational programme? *Journal of Evaluation in Clinical Practice, 10*(2), 207-217.

Stirman, S. W., Kimberly, J., Cook, N., Calloway, A., Castro, F., & Charns, M. (2012). The sustainability of new programs and innovations: a review of the empirical literature and recommendations for future research. *Implementation Science, 7*(1), 17.

Straus, S. E., Tetroe, J., & Graham, I. (2009). Defining knowledge translation. *Canadian Medical Association Journal, 181*(3-4), 165-168.

Sudsawad, P. (2007). *Knowledge translation: introduction to models, strategies and measures*: Southwest Educational Development Laboratory, National Center for the Dissemination of Disability Research.

Sullivan, K. J., & Cen, S. Y. (2011). Model of disablement and recovery: knowledge translation in rehabilitation research and practice. *Physical Therapy, 91*(12), 1892-1904.

Sutton, J., & Austin, Z. (2015). Qualitative research: Data collection, analysis, and management. *The Canadian Journal of Hospital Pharmacy, 68*(3), 226.

Symington, A. J., & Pinelli, J. (2006). Developmental care for promoting development and preventing morbidity in preterm infants. *Cochrane Database of Systematic Reviews,* 2.

Teddlie, C., & Tashakkori, A. (2009). *Foundations of mixed methods research: Integrating quantitative and qualitative approaches in the social and behavioral sciences*. Sage Publications: United States.

Tempest, S., & Roden, P. (2008). Exploring evidence-based practice by occupational therapists when working with people with apraxia. *British Journal of Occupational Therapy, 71*(1), 33-37.

The Council for Medical Schemes. (2015). *The Council for Medical Schemes Annual Report 2014/2015*. Retrieved from: https://www.medicalschemes.com/files/Annual%20Reports/AR2014_2015.pdf

Department of Justice (2013). The Protection of Personal Information (POPI) Act. Retrived from: https://www.justice.gov.za/inforeg/docs/InfoRegSA-POPIA-act2013-004.pdf.

Thomas, A., & Law, M. (2013). Research utilization and evidence-based practice in occupational therapy: A scoping study. *American Journal of Occupational Therapy, 67*(4), e55-e65.

Tong, A., Sainsbury, P., & Craig, J. (2007). Consolidated criteria for reporting qualitative research (COREQ): A 32-item checklist for interviews and focus groups. *International Journal for Quality in Health Care, 19*(6), 349-357.

Tricco, A. C., Ashoor, H. M., Cardoso, R., MacDonald, H., Cogo, E., Kastner, M., ... Straus, S. E. (2015). Sustainability of knowledge translation interventions in healthcare decision-making: A scoping review. *Implementation Science, 11*(1), 55.

UNICEF. (2018). *Nurturing care for early childhood development: A framework for helping children survive and thrive to transform health and human potential.* World Health Organization: Geneva.

UNICEF. (2019). *Levels and trends in child mortality: Report 2019.* Retrieved from New York: https://www.unicef.org/reports/levels-and-trends-child-mortality-report-2019.

United Nations. (2020). Sustainable Development Goals. *United Nations Development Programme.* Retrieved from: https://www.africa.undp.org/content/rba/en/home/sustainable-development-goals/background/

Unsworth, C. A. (2001). The clinical reasoning of novice and expert occupational therapists. *Scandinavian Journal of Occupational Therapy, 8*(4), 163-173.

Uys, L. (2002). The practice of community caregivers in a home-based HIV/AIDS project in South Africa. *Journal of Clinical Nursing, 11*(1), 99-108.

Vachon, B., Durand, M.-J., & LeBlanc, J. (2010). Using reflective learning to improve the impact of continuing education in the context of work rehabilitation. *Advances in Health Sciences Education, 15*(3), 329-348.

Van de Ven, A. H., & Johnson, P. E. (2006). Knowledge for theory and practice. *Academy of Management Review, 31*(4), 802-821.

Van den Berg, K. A. (2007). Individualized developmental care for high risk newborns in the NICU: A practice guideline. *Early Human Development, 83*(7), 433-442.

Van Stormbroek, K., & Buchanan, H. (2016). Community Service Occupational Therapists: Thriving or just surviving? *South African Journal of Occupational Therapy, 46*(3), 63-72.

Van Wyk, H., & de Beer, M. (2017). Inter-professional education: Healthcare students' experiences. *South African Journal of Occupational Therapy, 47*(2), 35-40.

Vergara, E., Anzalone, M., Bigsby, R., & Gorga, D. (2006). Specialized knowledge and skills for occupational therapy practice in the neonatal intensive care unit. *The American Journal of Occupational Therapy, 60*(6), 659.

Verhoef, J., Oosterveld, F., Hoekman, R., Munneke, M., Boonman, D., Bakker, M., ... Vlieland, T. V. (2004). A system of networks and continuing education for physical therapists in rheumatology: A feasibility study. *International Journal of Integrated Care, 10(4),* 19.

Virani, A. K., Puls, H. T., Mitsos, R., Longstaff, H., Goldman, R. D., & Lantos, J. D. (2020). Benefits and risks of visitor restrictions for hospitalized children during the COVID pandemic. *Pediatrics, 146*(2).

Wallin, L., & Eriksson, M. (2009). Newborn Individual Development Care and Assessment Program (NIDCAP): A systematic review of the literature. *Worldviews on Evidence‐Based Nursing, 6*(2), 54-69.

Wang, P. S., Lane, M., Olfson, M., Pincus, H. A., Wells, K. B., & Kessler, R. C. (2005). Twelve-month use of mental health services in the United States: Results from the National Comorbidity Survey Replication. *Archives of General Psychiatry, 62*(6), 629-640.

Watkins, S., Dewar, B., & Kennedy, C. (2016). Appreciative Inquiry as an intervention to change nursing practice in in-patient settings: An integrative review. *International Journal of Nursing Studies, 60*, 179-190.

Welch, A., & Dawson, P. (2006). Closing the gap: Collaborative learning as a strategy to embed evidence within occupational therapy practice. *Journal of Evaluation in Clinical Practice, 12*(2), 227-238.

Wensing, M., Bosch, M., & Grol, R. (2010). Developing and selecting interventions for translating knowledge to action. *Canadian Medical Association Journal, 182*(2), e85-e88.

Westrup, B. (2014). Family-centered developmentally supportive care. *NeoReviews, 15*(8), e325-e335.

Whipple, J. (2000). The effect of parent training in music and multimodal stimulation on parent-neonate interactions in the neonatal intensive care unit. *Journal of Music Therapy, 37*(4), 250-268.

Wigert, H., Blom, M. D., & Bry, K. (2014). Parents' experiences of communication with neonatal intensive-care unit staff: An interview study. *British Medical Council Pediatrics, 14*(1), 1-8.

Willig, C. (2013). *Introducing qualitative research in psychology*. McGraw-hill Education: United Kingdom.

Woods, D., Aldous, C., Christianson, A., & Malherbe, H. L. (2016). The contribution of congenital disorders to child mortality in South Africa. *South African Health Review, 2016*(1), 137-152.

World Health Organization. (2015). *The global strategy for women's, children's and adolescents' health (2016–2030): Survive, thrive, transform.* United Nations: New York, NY.

World Health Organization. (2020). Every Woman Every Child, The Global Strategy for Women's, Children's and Adolescents' Health (2016–2030). Retrieved from: www.who.int/lifecourse/partners/global-strategy/global-strategy-2016-2030/en

Wyszewianski, L., & Green, L. A. (2000). Strategies for changing clinicians' practice patterns. *Journal of Family Practice, 49*(5), 461-461.

APPENDIX A: Online Focus Group Schedule

Note:

(i) Information from the discussion will be recorded.

(ii) Prompting will be done throughout to encourage the discussion.

- Greetings and welcome to attendees
- A brief explanation of the purpose and expectations of the session
- Explanation of ground rules to be established (speaking one at a time etc., as it will allow for easier transcription and recording).
- An introduction will be facilitated amongst voluntary participants.
    - Names
    - Facilities
    - Personal expectations from the discussion

DISCOVERY QUESTIONS (Knowledge Creation and Utilisation)

1. ***What has drawn you to work with neonates?***

   Expected outcomes/prompting by facilitator: Interest? Personality? Forced into it: department procedure, need of population. Barriers/enablers – how are they overcome?

2. ***Where and how do you source your information on working with neonates? (Public health) How do you find your information for assessment and treatment?***

   Expected outcomes/prompting by facilitator: (prompting on feedback, redirecting therapists). Possible answers – department of health, colleagues, courses, internet, approach, protocols, routine? (KNOWLEDGE ENQUIRY) Overcoming barriers/enablers; what works? Tools, products, membership, buying practical guidelines.

3. ***How do you make sense of the knowledge that you source?***

   Expected outcomes/prompting by facilitator: Use this understand – synthesise compile (KNOWLEDGE SYNTHESIS) overcoming barriers/enablers

4. ***How do you adapt/tailor this to your specific context/practice?***

Expected outcomes/prompting by facilitator: Within the hospital. Overcoming barriers and enablers.

5. **Narrative: Typical day in neonatal intervention (NICU)?**

Expected outcomes/prompting by facilitator: Your day – implementation of questions 1-4. Hang onto "dream" about what you would like to do? Transition into dream/ideal. Sustain knowledge, adapt knowledge, access knowledge

6. **The IDEAL therapist**

DREAM QUESTIONS (Knowledge Creation and Utilisation)

1. **What/who is the ideal therapist for NICU?**

Expected outcomes/prompting by facilitator: knowledge, skills, personality/temperament/competence- CAN-meds document to analyse and Graham)? Talk about the ideal, not referring to self – redirect therapists

2. **What would be the ideal to share and sustain knowledge in NICU/neonatal care (engagement)?**

Expected outcomes/prompting by facilitator: Relating to the baby, therapist, family, NICU unit, satisfaction, support (KNOWLEDGE BROKERAGE)

3. **What is the ideal neonatal-care "tool-box"?**

Expected outcomes/prompting by facilitator: (Assessment, treatment, unit facilities, access to unit: how to get referrals).

4. **What does your IDEAL day in NICU look like?**

Expected outcomes/prompting by facilitator: schedule, timing, patient load, process, team, family?

- **Closure**
  - Thank participants for participation.
  - Offer information on how feedback will be provided.
  - Offer information on subsequent stages of study and invite participation.

APPENDIX B: Invitation to Participate in Research

Date: _____

Appreciating and Envisioning Knowledge Needs in OT intervention for Neonates in the Public Health Sector of KZN

Dear _____

You are invited to participate in a focus group discussion via the online platform ZOOM, with other permanent occupational therapists employed in the public health sector of KwaZulu-Natal.

Details of the online electronic platform discussion

Venue	Dates to choose from	Times to choose from
ZOOM Online Electronic platform	XX/XX/2020 (Tuesday) XX/XX/2020 (Wednesday)	12:00PM - 14:00PM (Day session) 18:30PM - 20:00PM (Evening session)

Please indicate in your response which date suits you best. It would be appreciated if all therapists who work with neonates attend the online discussion of their choosing. Different dates and venues will allow for therapists from the same institution to attend on alternate days if preferable. All participants will be sent a ZOOM link to their email addresses; this link will direct you to the platform.

Please note: A STABLE INTERNET CONNECTION IS MANDATORY. Please let us know of your concerns regarding your internet connection at your institution or on your personal device. Kindly respond with your concerns and RSVPs by the 03/04/2020 so that the necessary arrangements can be made. Your input in this study is highly valued.

Thank you.

Ayesha Dawood (Primary facilitator)

APPENDIX C: Information Sheet & Consent

Date: _____

Online Focus Group Discussion Information Sheet and Consent to Participate in Research

We are a team of therapists and researchers that are working on a larger study entitled, *"Bridging the knowledge-to-practice gap in rehabilitation professionals working with at-risk infants in the KZN public health sector"*. You are invited to participate in this phase of the study, which involves a focus group discussion. This sub-study is entitled, "*Integrating knowledge to practice for occupational therapists working with high risk infants in the KwaZulu-Natal Public Health Sector: A Qualitative Explorative Inquiry."* Before deciding whether you would like to participate or not, it is essential for you to consider the purpose of the study and your potential role.

What is the purpose of this study? The occupational therapist working in the NICU is required to have expert training in NDSC in order to be able to plan inclusive intervention, evaluation and discharge planning of the neonate, providing education to staff and families, as well as making fast, efficient and effective decisions (Hockenberry & Wilson, 2018; Nightlinger, 2011; Royal College of Occupational Therapists, 2017). There is a scarcity of research available on the role and scope of occupational therapists within the NICU/high care in the South African context. A recent study by Hardy et al. (2019), discovered that occupational therapists found it difficult to establish their roles within the NICU; therapists also felt that they did not have the adequate skills and knowledge to work in the stressful NICU environment. The hardships experienced in the public health sector, especially with the high infant and child mortality and morbidity rates is an indication of the need to translate evidence-based knowledge into practice. Therefore, it is important that current clinical standards of care are determined before EBP can be applied (Robinson, 2000). This study is aimed at discovering the current knowledge to practice gaps and visualizing the ideal knowledge to practice interventions for occupational therapists who support high risk infants in the public health sector of KZN.

Why have I been invited to take part? As an established expert in this field we are keen to hear your views on your experiences in the care of neonates and at-risk infants in the public health setting. We plan to recruit approximately 20 full time employed therapists currently working in the field of neonatal care in the public health sector. Participants will include only occupational therapists.

What will I be asked to do if I agree to participate? You will be required to complete a consent declaration and a brief demographic questionnaire. You will then be requested to indicate your suitability of an afternoon (12h30-14h00) or evening session (18h30-20h00) for participation on two different days. There will be two sessions so that therapists from the same institution can attend (during their lunch hour or after hours). A stable internet connection is mandatory. Please inform us of your concerns regarding your internet connection at your institution or on your personal device. Kindly respond with your concerns and RSVPs by the **XX/XX/2020** so that the necessary arrangements can be made to assist in ensuring your participation.

Confidentiality: Participant contributions will be video and audio recorded and downloaded to the PI's encrypted laptop. The use of the video will only be used for transcription to text. All responses received in the study will be strictly confidential, and participant identity will not be indicated on the transcript.

Data protection: The discussion will be hosted on a licensed ZOOM platform. The unique link and Meeting ID will be sent to all voluntary participants. The video, audio recordings and transcriptions will be downloaded to the team's encrypted laptop to allow for analysis. Data will be stored for the duration of the research project only and then deleted.

Research Ethics: The proposed study abides by the ethical requirements of the University of KwaZulu Natal, aiming to assure 'rigour, respect and responsibility' in the conduct of the research project. This study has been ethically reviewed and approved by the UKZN Biomedical Research Ethics Committee (approval number **BREC/00001886/2020**).

What do I do now? Thank you for taking the time to read through this information sheet and for considering participation in this study. Please indicate as to whether you would like to participate by a reply email. If you agree to participation, we would be very grateful if you could also complete the attached consent form.

In the event of any problems or concerns/questions you may contact Ayesha Dawood (mobile number: XXXX; email: Ayesha@shlabit.net). You may also contact the UKZN Biomedical Research Ethics Committee, should you be concerned with any of the ethical processes as follows:

BIOMEDICAL RESEARCH ETHICS ADMINISTRATION

Research Office, Westville Campus, Govan Mbeki Building,
Private Bag X 54001, Durban, 4000, KwaZulu-Natal, SOUTH AFRICA
Tel: 27 31 2604769 - Fax: 27 31 2604609 Email: BREC@ukzn.ac.za

Voluntary Participation and Right to Withdraw Kindly note that participation in this research is voluntary and you may withdraw participation at any point. There is no implication in the event of refusal/withdrawal of the involvement in this particular study. There are no unnecessary costs that may be incurred by participation in this study. As a potential participant, your time and access to a computer/internet are required.

Incentives/Reimbursement There are no incentives or reimbursements for participation in the study.

CONSENT DECLARATION

I _____have been informed about the study entitled *"Integrating knowledge to practice for occupational therapists working with high-risk infants in the KwaZulu-Natal Public Health Sector: A Qualitative Explorative Inquiry"* by Ayesha Dawood.

- ☐ I understand the purpose and procedures of the study.
- ☐ I have been given an opportunity to answer questions about the study and have had answers to my satisfaction.
- ☐ I declare that my participation in this study is entirely voluntary and that I may withdraw at any time without any undue consequences.
- ☐ I have been informed that there are no incentives or reimbursement for participation.
- ☐ I have been informed that the study findings will be published and possibly presented in various fora, with the understanding that my identity will not be disclosed in any of these dissemination activities.
- ☐ I consent to video and audio-recording of the session via the Zoom or alternate platform.

If I have any further questions/concerns or queries related to the study I understand that I may contact the researcher, or the PI of the study (as aforementioned).

If I have any questions or concerns about my rights as a study participant, or if I am concerned about an aspect of the study or the research team then I may contact:

BIOMEDICAL RESEARCH ETHICS ADMINISTRATION

_____ _____

Signature of Participant Date

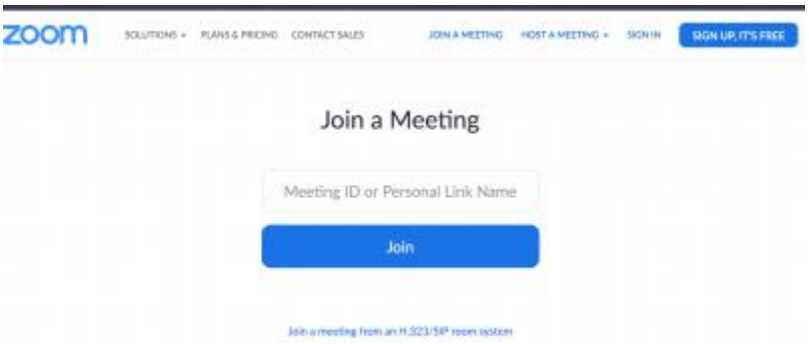
_____ _____

Signature of Witness Date

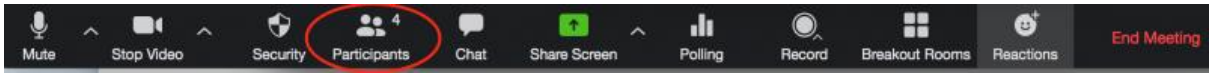
APPENDIX D: Zoom Guide for Research Participants

Please find the easy guide below to assist you with ZOOM etiquette

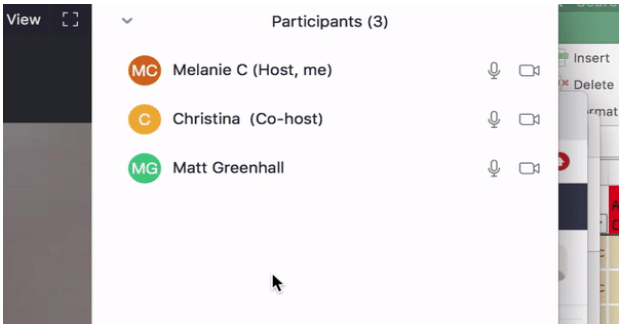
- Ensure that you have a stable and working internet connection prior to the discussion.
- To ensure that we begin on time, please try to join the meeting five minutes before the start time.
- Use the email link and password to enter the ZOOM meeting room, or:
- Go to the ZOOM website and click on 'join a meeting' on the top navigation bar, enter the meeting ID (normally nine digits) sent to you via email in the box provided and click join. You will also be prompted to enter a password also sent to you via email.
- Depending on your browser you may be prompted to download the ZOOM app.



The chat window will open. You will be asked to type in a username. You can either put in your name, use your initials or a pseudonym that you prefer. Please be advised that this cannot ensure your confidentiality as your voice can still be heard by all participants. If you need to change your name open the participants box (click on participants on the bottom navigation bar).



Click on your name, click 'more' and then 'rename' in the dropdown box. This will open box in your zoom window where you will be able to change your name.

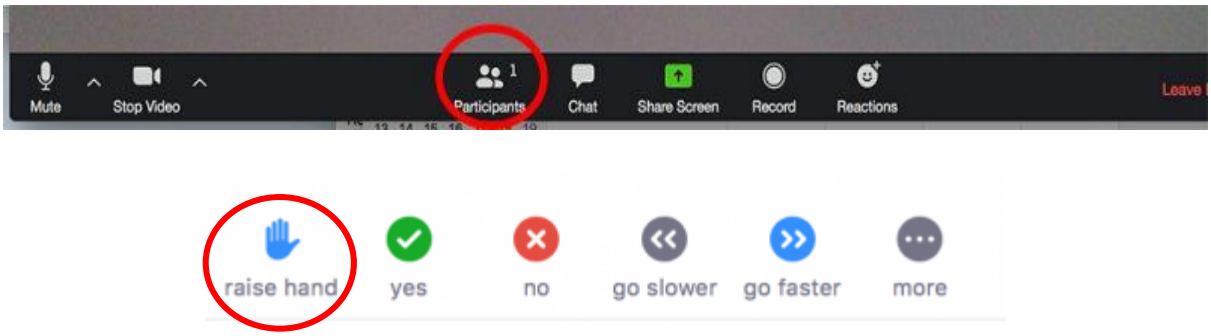


You will be prompted to 'join with computer audio'. Your voice cannot be anonymised.

You can click on the buttons at the bottom left corner of the screen to mute or activate your microphone, or to turn your video on or off. Keeping your videos on is not mandatory but it is encouraged. If keeping your video on would affect the bandwidth or internet connection, it is best to keep it off to avoid unnecessary disruptions during the research discussion.

To keep background noise to a minimum, make sure that your mic is on mute when you are not speaking. To ensure your privacy, and the privacy and confidentiality of the other participants, it is encouraged that you find a quiet room to participate in the online discussion or use earphones.

If you would like to respond or add on to what other participants are saying, please click on participants, and use the raise hand option available on the bottom of your navigation bar. This will open a window on the right side of your screen.



Once you have finished speaking, please uncheck the raise hand button, and mute your microphone.

You may also add comments to the chat window if appropriate.

Please note that informed consent for the discussions to be recorded will be required to use the online recording function on the ZOOM platform. This will be stored on secure database that will only be accessible to the researcher and supervisors of this study. Recordings will be used to transcribe the data received.

You will be asked to provide informed consent to your participation verbally or using hand gestures (thumbs up, raise hand) on ZOOM before the discussions begin.

APPENDIX E: Proforma for Demographic Information

Appreciating and Envisioning Knowledge Needs in OT intervention for Neonates in the Public Health Sector of KZN

Please can you place a tick in the boxes provided below:

1. **What is your gender?**

   Female ☐ Male ☐

2. **How many years of experience do you have in clinical practice?**

   2-5 years ☐

   5-10 years ☐

   10-15 years ☐

   <15 years ☐

3. **What level of care in the public health sector do you belong to?**

   District ☐

   Regional ☐

   Tertiary ☐

   Academic ☐

4. **At which tertiary institution did you complete your undergraduate training?**

   University of KwaZulu-Natal ☐

   University of the Witwatersrand ☐

   University of Pretoria ☐

   Sefako Magatho Health Science University (Ex Medunsa) ☐

   University of Free State ☐

   University of Western Cape ☐

   University of Cape Town ☐

   University of Stellenbosch ☐

5. **Did you have any additional training to work with neonates/high risk infants?**

   Yes ☐ What training have you received? _____

   No ☐ What is the reason for you not receiving any training? _____

APPENDIX F: Demographics of Participants

No.	Pseudonym	Gender	Years of experience	Level of care	KZN District	Institution (UG Training)	Additional training	If yes, what training? If no, reason for not receiving training?
1	Ashley	Female	10-15 years	District	Umkhanyakude	UP	Yes	NDT 8-week paediatric course, although this is not focused on neonates it deals in depth with typical neuro development in early childhood. I have wanted to attend the little steps training for some years now, but have prioritized the training of community service SLT's on this course as they have in the past been vital in assisting with running the high-risk baby programme
2	Anne	Female	<15 years	Tertiary	Umgungundlovu	UKZN	Yes	Little Steps Neonatal Course Various small courses over the years.
3	Ciara	Female	5-10 years	District	Ethekwini	UKZN	Yes	I attended the Little Steps Neurodevelopmental Supportive Care course in November 2019. I also attended a 1-day workshop held by Gina Rencken at UKZN.
4	Danielle	Female	<15 years	Regional	Ethekwini	UKZN	No	Neonates are a very small percentage of our caseload.
5	Tasha	Female	5-10 years	Tertiary	Ethekwini	UKZN	Yes	Little steps – supporting the preterm infant (2019). NDT advanced baby course (2020)
6	Amy	Female	5-10 years	Regional and district	Ethekwini	UKZN	Yes	Introduction to high risk babies – workshop.
7	Jane	Female	10-15 years	Regional and district	Ethekwini	UKZN	Yes	I attended a one-day training presented by Gina Rencken at UKZN in 2019. No further training received. Neonatal courses are expensive to attend. Courses are seldom brought to UKZN.

No.	Pseudonym	Gender	Years of experience	Level of care	KZN District	Institution (UG Training)	Additional training	If yes, what training? If no, reason for not receiving training?
8	Lisa	Female	5-10 years	Regional and district	Ilembe	UCT	Yes	• Neurodevelopmental supportive care for premature infants • WHO Infant and Young Child Feeding • Infant Sensory Integration Training • Independent further study
9	Lorna	Female	2-5 years	District	Ilembe	UKZN	Yes	I was exposed to neonates in community service and was part of the high-risk baby clinic and received extensive training from senior therapists. I have attended an IMAM in service training in 2018 and a breastfeeding training in 2020. Theses trainings have assisted me in managing neonates/high risk infants.
10	Nelly	Female	2-5 years	Regional /District	Ethekwini	UWC	No	Only informal training from nursing staff – not specific/casual talk.
11	Alex	Female	2-5 years	District	Umgungundlovu	UKZN	No	I have not done any courses relating to neonates and high-risk babies. Furthermore, I have had difficulties finding courses that are specific to neonates.
12	Pat	Female	5-10 years	District	Harry Gwala	UKZN	Yes	I have done short courses on High Risk Babies. I am also trained in Neurodevelopmental Therapy (Basic 8-week Course)
13	Julia	Female	5-10 years	Tertiary	Umgungundlovu	UKZN	Yes	Workshop on high-risk babies.
14	Tara	Female	2-5 years	District	Zululand	UCT	No	Lack of funding.
15	Ben	Male	2-5 years	District	Harry Gwala	UKZN	No	I have never received any spare time to do courses. Staff shortages and procrastination are the major causes.
16	Tanya	Female	<15 years	District	Umkhanyakude	US	Yes	NDT baby course.
17	Rachel	Female	5-10 years	Regional	Ethekwini	UKZN	No	I do not treat many neonatal patients unless it is needed, as it is not my passion.

APPENDIX G: Common Themes and Ideas

1. What has drawn you to work with neonates?

- **Referrals** from paediatric Doctors. Paediatric need at the hospital. Good working relationship with the paediatric Doctors and nurses who understand the discharge protocols for each neonate/child in terms of follow up appointments E.g. High-risk baby clinics, early childhood intervention clinics, developmental delay clinics.
- **Procedure of the hospital to refer to Occupational therapy (OT)** not necessarily an interest in paediatrics.
- Providing paediatric intervention is within the **OT scope of practice**.
- **Personal interest** in paediatrics – ECI and developmental delays, cerebral palsy.
- Seeing the **larger picture of developmental outcomes** if early childhood intervention began early, it would curb the extent of the disability if there was one identified, and therefore increase functional outcomes of the child.
- **Disablers/barriers** – Lack of funding from government to attend courses on neonates, OT's have to self-fund courses and they are not always affordable, not being trained in neonates during undergraduate training, poor understanding from parents seeing the importance of intervention in the NICU – feeding is a priority for them, increased defaulting of follow up appointments, poor fluctuating staffing to sustain neonatal programmes consistently, not receiving referrals often due to continuous rotation of Dr's at district institutions, they are unsure about the role of rehab – OT's rely on self-screening/being proactive, identifying high risk infants themselves, other rehab staff sometimes refer to OT.
- **Enabler** – Hospital management acknowledging that the OT department has programmes for early childhood intervention that identifies childhood disability early, good proactive head of paediatric departments and Dr's who acknowledge the need for MDT rehab and early childhood intervention, High risk baby clinics, having training in NDSC/advanced baby course/CP courses, the use of an online database for tracking and follow up of high risk patients (2 x hospitals).

2. Where and how do you source your information on working with neonates? (Public health) How do you find your information for assessment and treatment?

- Research online – websites, journals, NANT,
- Textbooks
- Past experiences
- Courses/workshops – **Little steps**, UKZN Neonatal courses by Gina Rencken
- From their individually developed referral forms/ the child's neonatal booklet, nurse's neonatal checklist (guideline from the DOH,

- **Speaking to senior therapists/colleagues (OTs) with experience** in the field and they share resources that they developed in their institutions. Other colleagues such as paediatricians, neonatologists at their institutions, paediatric academic supervisors that come to the institution teach students and therapists learn to
- MDT ward rounds, working in an MDT – finding shared intervention and strategies in each field – learning from each other.
- RTHC

3. How do you make sense of the knowledge that you source?

- **Adapting** research from first world countries and courses to their specific context.
- New therapist – **trial and error**. Trying what works for others and see if it works at their institution.
- Colleagues who have experience and training direct you if you unsure of what knowledge is applicable. **(Enabler)**
- Understanding the anatomy and physiology – to cause no harm/do no harm. If you are unsure you should not intervene as you increase the risk of harm.
- Knowing the **ethics behind treating a neonate**.
- Using clinical reasoning together with the information sourced.
- **Liaising with MDT**, doing in service training with MDT if you attended NDSC courses. Creating a base standard to work from even if there is changes in staff.
- Think out the box, be creative to adapt to context and not having enough resources, DIY ideas for parent to adapt for home programmes,
- Profile patients, reading their medical files/background intervention received, developing own assessment form with possible interventions that could be done in treatment - tailor needs/problems of child and context (District to tertiary level institutions have different availability of resources.
- **Enabler -** Parent focused interventions. Educating parents individually and through groups, adapting intervention to patient and parent's needs – Parents are always around the ward/NICU as compared to MDT
- **Disabler/Barrier –** Sourcing information that is "sound"/ evidence based and what actually makes a difference – most treatment seems popular, but is it benefiting parents and child?

4. How do you adapt or tailor this to your specific context or practice?

- Poor follow up and understanding of OT role in district institutions. Drs are younger with less experience, more rotational work. Poor medical leadership at district.
- Training, **empowering CCG's** to identify high risk children in communities.
- Proving to management that ECI can save the hospital and the DOH money.
- Created checklists/referral forms/ visual reminders to increase referrals to OT.
- In-service training with MDT if been on NDSC courses.
- Creating education pamphlets for parents (isiZulu and English) – stimulation, milestones.

- Having support groups for parents, running group therapy in the NICU, encouraging peer counselling.
- Prioritise problem areas. Sometimes less is more. Too much information is overwhelming.

5. Narrative: Typical day in neonatal intervention (NICU)? Reality of the context you are in? What does it look like?

- Going to NICU daily. Encourage KMC and parent education (PROM, positioning, follow up appointments), tailor individual treatment plan per child and family.
- Not getting to the NICU daily – poor staffing. Patients seen on referral basis only.
- Liaise with MDT for collateral information. Look at RTHC if needed.
- In service training with MDT from NICU weekly – sometimes for CPD.
- MDT ward rounds weekly, weekly meeting with neonatal MDT team, and those colleagues that have an increased interest in paediatrics.
- Short and chaotic. Trying to fit intervention in between feeds, medical work ups and sleep states.
- Individual parent education, group therapy, positioning of infants.

6. What or who is the ideal therapist for NICU?

- Someone who has specialised neonatal training.
- Puts the child and parent first always.
- No Community service therapists should be allowed to work in NICU.
- A richer undergraduate or postgraduate training will put out decent neonatal therapists.
- Has **knowledge, passion, interest** in neonates, as it can be emotionally draining.
- **"Thick skinned", assertive yet gentle. A confident, calm, present, mindful individual**.
- Open, consistent, trustworthy, positive attitude, strong willed patient, good communication skills to work with parents and MDT.
- A designated therapist for the NICU who genuinely wants to be working there.

7. What would be the ideal to share and sustain knowledge in NICU or neonatal care (engagement)?

- Regular in-service training with MDT – in institution and district. Developing good working relationships with the nurses and doctors. Be more visible in the NICU, talk about OT's role in NICU.
- Educating medical management and paediatric management on role of OT.
- Handing over and sharing of knowledge from courses with other therapists, junior staff to build their confidence.
- Introducing students to the idea of working in the NICU by letting them watch treatment sessions and educating them on the OT's role in the NICU**.**

- Sustainability of the therapist. Same therapist from NICU should run the high-risk baby clinics as parents have developed relationships and are comfortable with the therapist. The sustaining of knowledge received from the NICU over time.
- Making yourself known and visible to the paediatric medical team.
- Providing training on NDSC to operational managers of the NICU and medical interns.
- Training CCGs to carry out ECI/detection at community levels. Add OT number on RTHC.
- Doctors do not want to attend OT in service training. Provide posters – So Drs and nurses cannot ignore the role of OT in the NICU.

8. What is the IDEAL neonatal care "tool-box"?

- A well-trained dedicated occupational therapist whose main function is working with neonates/paediatrics.
- Having more staff, different sections for various diagnoses.
- Appropriate home programmes for each condition for parents to take home.
- **Well-researched evidence-based protocols adapted for each context**.
- Standardised assessments for the South African context that can later be used for research purposes. All standardised assessments available currently are from first world countries.
- A controlled NICU environment.
- **A NICU kit that will stay in the NICU only** – promotes IPC.
- Equipment/materials - **Special positioners/nests, KMC wraps, prem nappies**.
- Safe comfortable space to educate and speak to parents, families.
- All institutions to have a follow up clinic/HRBC with the full MDT and one date for convenience of the parent.

9. What does your IDEAL day in NICU look like?

- Having time to work on the needs of the child and parent, to attend ward rounds. Being in the NICU all day to be able to structure treatment to sleep wake cycles, individual needs.
- Being flexible and fluid in which child and parent you are seeing when.
- Not having to wait for referrals. Seamless referral systems amongst MDT.
- To participate collectively as a MDT. Starting the day with a team meeting, everyone discussing their interventions/plans/goals for the neonate.

APPENDIX H: Codes and Sub-Codes and Themes

- Themes identified in advance in yellow
- Themes derived from the data in blue

	Main code	Sub code	
1	Adapting to context	CCGs	
2	Ethical practice in the NICU		
3	Family		
4	Typical day in the NICU	Environment	
5	Ideal day in the NICU		
6	Ideal therapist		
7	KMC		
8	MDT	• High Risk Baby Clinic • Poor Referrals from MDT • Supportive Medical Personnel	
9	NICU Toolbox		
10	Policies and protocols		
11	Sourcing information	Tools	• Colleagues • Courses • Internet and journals
12	Sustaining knowledge	• Barriers • Enablers	
13	Synthesising knowledge		
14	The baby		
15	Working with neonates	• Barriers • Enablers • Interest • Referrals	
16	Young mothers		

APPENDIX I: Themes influenced by Objectives

	Possible Themes	Nodes	Sub nodes	Objectives of the study
1	***Knowledge Acquisition***	MDT Policies and protocols Sourcing information	• High Risk Baby Clinic • Supportive Medical Personnel • Tools ○ *Colleagues* ○ *Courses* ○ *Internet and journals*	To discover how occupational therapists source information and knowledge to support the neonate.
2	***Knowledge Synthesis and Translation/Utilization***	Ethical practice in the NICU Sustaining knowledge Synthesising knowledge Family	Barriers Enablers	To explore how occupational therapists, synthesise knowledge and translate it into practice with neonates.
3	***Contextual Barriers and adaptation***	Adapting to context MDT Typical day in the NICU KMC The baby Young mothers	CCGs/CHWs Poor Referrals from MDT Environment	To explore how occupational therapists overcome barriers, and what enables them to adapt their intervention strategies to their specific contextual needs.
4	***OT and Neonatal Care in the Public Health Sector***	Working with neonates	• Barriers • Enablers • Interest • Referrals	To explore what factors, motivate occupational therapists to work with neonates.
5	***The Ideal OT and Neonatal setting/context/environment***	Ideal therapist Ideal day in the NICU NICU Toolbox		To explore the desires and dreams of the ideal occupational therapist who provides neonatal intervention.

APPENDIX J: Results

Sub-theme	Descriptions and verbatim responses
THEME 1: OT and neonatal care in the public health sector	
Inhibitors in working with high risk infants	There are several inhibitors in providing adequate, efficient and effective OT services and support to high risk infants in the public health sector of KZN. Ashley perceives a common inhibitor in providing quality interventions to high-risk infants is that the facility that they are employed in, does not fund training for therapists to improve and expand on their knowledge and skills. Paying for training on a personal capacity is not always affordable. *'Money is the big disabler, the fact that they don't fund training.'* ***(Ashley).*** Furthermore, Amy believes that they were not provided with enough knowledge and skills to work with high risk infants during their undergraduate training. This left therapists to self-learn skills and appropriate interventions to provide to high risk infants through their daily experiences working in the NICU, high care and KMC units. *'I think one of the barriers we have as new therapists, we weren't really trained in neonatal care on campus and you go into this new hospital and you have to learn as you go along.'* ***(Amy)*** Once the infant is discharged from the NICU, high care and KMC units, they do not always comply with their follow up appointment dates with the high-risk baby clinic programs at the facility they belong to. Follow up appointments usually monitor the medical, feeding and overall development of the infant up to 2-3 years of age – this varies at different facilities. Tanya outlines that it is a difficult process to locate patients who default when the program is large, there are time limitations and poor staffing of OTs at most facilities in the KZN public health sector. *'The barriers I would say is finding patients that's defaulting, partly because the program became quite big and also its quite intensive-time intensive so if you drop your staff-levels, suddenly you're just a third of what you used to be it's quite difficult to appraise people who are defaulting.'* ***(Tanya)***

	Staffing numbers in the rehabilitation and allied professions in the KZN public health sector have drastically decreased since the moratorium placed on posts in the year 2016. This has led to many smaller departments being managed solely by community service therapists, whilst other departments in regional and tertiary facilities struggle to provide full time OT services in wards that require the service consistently. Anne describes an inhibitor as not having adequate staffing to place an OT full time in the NICU. *'Some of our disablers is that we don't have enough staff to be able to work in neonatal ICU and ideally we'd have an OT working full time there.'* ***(Anne)***
Facilitators in working with high risk infants	There are several facilitators in providing adequate, efficient and effective OT services and support to high-risk infants in the public health sector of KZN. Ashley perceives the management of some facilities as being a facilitator in supporting the OT role in providing intervention to high risk infants in the NICU, high care and KMC units. Hospital management is also supportive of follow up programs once the infant and mother are discharged. This allows for management to identify that OT programs are implemented smoothly and allows for recognition of the OT role in early childhood intervention. *'An enabler is definitely your management where you show how well your program can run and if you feed from one program into the next program and you're getting early childhood disability on top of it then that's an enabling factor.'* ***(Ashley)*** Ciara finds that a facilitator is that *"the head of paeds is really on board with rehab and early childhood intervention."* ***(Ciara).*** Amy agrees with Ciara as she feels that '*our doctors they really pro OT and they're pro stimulation in neonatal ICU, so I think that's one of the facilitating factors.'* ***(Amy).*** Both believe that the doctors that work in paediatrics at their facilities acknowledges the role and benefit of OT intervention in paediatrics, early childhood intervention and in neonatal care.
	Occupational therapists may not have had enough exposure to hospital-based paediatrics during their undergraduate training. '*Initially it was that I never had any exposure to working with neonates as a student or during varsity but once I did comm serve and started working in the department of health, obviously we got referrals for babies from the nursery and neonatal ICU and I'm really interested*

Interest in paediatrics and neonatal OT practice	*in it.'* ***(Ciara).*** Once therapists are placed at various facilities to complete their community service, they are more than likely required to provide intervention to paediatrics in all spheres. Therapists who work in the field of paediatrics generally have or develop an interest and passion for working with neonates and children. Further training, courses, and workshops focusing on early childhood intervention in the area of paediatrics and neonatal care increases a therapist's interest in the field, as they feel more confident and equipped to provide therapy to high risk infants or children. *'I was fortunate enough to be sponsored to go on a lot of training for CP which was the NDT and Advanced baby and from those just stressing early intervention and early identification and that's how I got slotted in to the interest in neonates after the advanced baby that I just finished recently.'* ***(Tasha)*** Many years of clinical experience in the area of paediatrics, allows for therapists to monitor the impact on the quality of life of an infant at risk if early intervention was initiated, versus a child who has not received any intervention at all and therefore has poor functional outcomes. *'I think for me, it's been a combination of seeing the outcomes later in life and just knowing if you worked backwards they could've introduced access care a lot earlier in the system and then through experience having worked with them early on and seeing the impact that an intervention can make really reinforced for me why it is so essential to get into that field and the importance of early intervention.'* ***(Lisa)***
Referral system to OT as part of the facility's paediatric protocol and policy	Most facilities in KZN develop their own standard operating procedures (SOP) with regards to paediatric protocols and policies on the referral system to other disciplines or departments. Therapists at some facilities only assess and provide intervention to patients when they are referred to OT by the doctors from the paediatric departments. *'It's quite difficult with our hospital because we only get to see patients when they refer according to the referral process that they have here.'* ***(Alex)*** Therapists do not blanket cover wards due to inadequate staffing in most facilities in KZN, as well as they comply with the set SOP of the facility. This makes it difficult for therapists to have a consistent presence in the NICU, high care and KMC units as they follow the indicated SOP of the facility that they are employed in.

	Jane and Alex indicate that it is not a personal choice or interest for them to work with neonates or high-risk infants. *'I wouldn't say we're drawn to it by choice, but we have quite an increased number of referrals.'* ***(Jane)*** They provide assessment and intervention in the NICU, high care and KMC units only upon referrals received from the doctors. *'I don't think we're drawn to do it; I think it's a matter of the referrals that we get from the doctors and then we just do the treatment as per requirements or as we see necessary.'* ***(Alex)***
THEME 2: Knowledge Acquisition and Knowledge Synthesis	
Acquiring knowledge from the multidisciplinary team (Doctors, nurses, rehab team)	Lisa acquires knowledge from other disciplines such as medicine, and other health professions to aid in developing integrated intervention strategies to support the high-risk infant. Strong relationships are formed between disciplines with knowledge brokerage being implemented as they learn and share the expertise of their roles in the care of the neonate. *'The other source comes to think of it is colleagues, we have had the most amazing paediatricians and neonatologists that we got to work with, both South African and international and having that shared sort of think tank where you're working with a dietician, in combination with a paediatrician, with a neonatologist and an OT, and you're getting all together and you're starting to think about intervention strategies and everyone starts sharing expertise from their fields, we developed a strong multi-disciplinary team and we got to learn from each other which was really great.'* ***(Lisa)***

	Ben views the nursing staff in the NICU, high care and KMC units as an important role player in understanding the OT scope of practice in the care of the high-risk infant. Therapists generally rely on nursing staff in reminding or influencing medical personnel to refer to OT. *'You need to form that bond with the nurses because we have that understanding and they are always there and the doctors are not always there, the nurses play a critical role in getting referrals from the doctors.'* ***(Ben)*** Julia acquires knowledge of the high-risk infant through medical officers, specialist paediatricians and neonatologists as well as nursing staff. Grand MDT ward rounds in the NICU, high care and KMC units also promote knowledge brokerage amongst the various disciplines as each share their knowledge and skills in providing the needed intervention for the infant and family. Rehabilitation professions from other disciplines such as Audiology, speech therapy, physiotherapy etc. have a Watsapp group, where they share information or refer patients to each other. *'From the doctors, the specialist and some of the nurses. There's also MDT ward rounds and case studies where they present the patient and we can get the information from. Also, from the MDT group, so in terms of speech, audio we have a whatsapp group and if there's any referrals or anything they pick up they let us know we can see the patient and then make a referral.'* ***(Julia)*** A general overview of intervention in the NICU, high care and KMC units is that an MDT approach in the care of the high-risk infant encourages improved outcomes of the neonate. *'You work together with the nurses, the doctor and the therapists and the baby's mom in order to improve the outcomes of the baby.'* ***(Anne)***
Sourcing information to support OT neonatal practice	Julia makes use of the patient's road to health care (RTHC) (clinic book used to record immunisations, weight gain and to other information on the child's birth history etc.) to educate parents on the developmental milestones that the infant should achieve. The RTHC contains simple illustrations with IsiZulu and English translation. This makes it user friendly to mothers that are literate or illiterate in the KZN population. *'The patient road to health card, road to health booklet gives us a lot on the developmental milestones.* ***(Julia)***

	Furthermore, Ashley utilises the information provided in the paediatric assessment forms in the infants file whilst they are admitted in hospital. This information assists in understanding the infant from a medical and rehabilitation point of view as the therapists can source information on what the doctors are assessing and treating as well as other disciplines such as speech therapy etc. *'When you go to the file, you can go through the congratulation's booklet, you can go through the neonatal assessment form as they come into the NICU, you go through all of that and that's where you get information.'* ***(Ashley)*** Besides sourcing information from the infant's admission records and booklets, Julia sources information about the infant through interviews with the family or parent. Comprehensive referral forms that OT departments in different facilities have created individually, also assist in gathering information about the infant from the treating doctor. *'We source our info from just being able to work in the NICU, from the patient record, so the patient file, the interview with the mom or dad or the parents, from the referral letter, we have a request for consult that the doctor has to fill.'* ***(Julia)*** *'We have a referral form that has a tick box that the doctor who works in the neonatal ICU and the maternity ward has to tick and then according to that information, the baby is referred so that is prem, low birth weight, congenital abnormalities, club foot, erbs palsy, poor sight, NNE, jaundice.'* ***(Ashley)***
Acquiring information, knowledge and skills from multiple sources (Colleagues)	Julia acquires information, knowledge and skills from textbooks that are available in her department on paediatrics/neonatal care. She may also consult colleagues or peer groups who are experienced in the field to advise on the best possible intervention for difficult cases. *'We also have textbooks within our department that we might consult, or other therapist or other colleagues, peer groups.'* ***(Julia)*** Tasha found as an inexperienced therapist that it was helpful and beneficial to have access to experienced mentors in the field of neonatal care within the KZN public sector to advise her on correct assessment and intervention. *'I learnt a lot from senior therapists across KZN as a junior therapist.'* ***(Tasha)***

	Ciara, like Julia and Tasha found acquiring knowledge and skills from colleagues as helpful. '*It's just having access to speak to colleagues that have more experience, so when I first started out obviously being able to speak to people that that had more experience in the NICU, those courses that I attended, those were the things that really helped me, like little steps was really great.' **(Ciara).*** Courses and workshops on neonates are also of benefit in increasing knowledge and skills and making a therapist feel more confident in the care of the high-risk infant. Colleagues with experience was the main point that therapists identified in acquiring knowledge and skills in the care of the high-risk infant and to guide them in making use of the correct information and treatment modalities. Experienced therapists also assist by encouraging the use of scientific evidence through published journals on neonatal intervention. Therapists also believe that most of the knowledge and skills they develop or acquire come through their own clinical experiences with trial and error in the field of neonatal care. *'I think the main thing that's really helpful is colleagues they are the ones that are actually able to help you to say okay you shouldn't use that kind of information and direct yourself to these types of articles that you can read about but mainly it's trial and error honestly.'**(Lorna)***
Acquiring information, knowledge and skills from multiple sources (Courses, workshops)	The Little Steps course, which focuses on NDSC for premature infants is one of the most popular if not the only course available in South Africa, which caters for nurses, doctors, physiotherapists, speech therapists and OTs who work with high risk infants in the NICU and high care units. *'I did that, little steps neurodevelopment training last year in November.' **(Ciara)*** Therapists identified and perceived this course to be helpful in increasing their confidence, knowledge and skills in working with high risk infants and their families in the stressful and demanding NICU environment. The Little Steps course is not affordable to all therapists and therefore some therapists who have attended the course provide in service training (knowledge brokerage) to others so that they are able to educate staff in their specific facilities to implement NDSC strategies within the NICU and high care units.

	'The Little Steps course which we haven't attended personally but have gotten in-service training from therapists that did it and the suggestions made for how you can work in the neonatal ICU were brilliant and we just took it back and in serviced it in our hospital and just said how can we ask the nursery to intervene.' ***(Jane)*** Besides the Little Steps course, Lisa has also attended other courses in infant sensory integration to expand her knowledge and skills to work with the high-risk infant. *'I'm sure a many people have attended the Little Steps training which offers neurodevelopmental supportive care to premature infants, I think that's kind of the go-to and only course available currently in South Africa. There's also been the infant sensory intervention training hosted in South Africa which I have been fortunate to attend, so those are sources of information that I've had access to.'* ***(Lisa)*** Academic supervisors from the University of KZN provide knowledge brokerage through offering workshops on working with the high-risk infant to clinicians. Academic supervisors also educate students whilst they are at their clinical sites. This allows for clinicians to also observe and learn concurrently. *'We've also learnt a lot from the academic supervisors that have come to RK Khan from UKZN that are quite knowledgeable in the fields. They've either educated us through opening their workshops to us as well as them teaching their students, we use that opportunity to also observe and we've learnt a lot through them as well.'* ***(Jane)***
Acquiring information, knowledge and skills from multiple sources (Internet and journals)	Lisa keeps updated in the field of neonatology by acquiring and improving on her knowledge through engaging with scientific evidence from published articles in neonatal journals. *'There's lots of really superb cutting-edge research coming out so accessing journal articles in the latest neonatal journals, there's also a lot of OT research coming out which is very exciting.'****(Lisa)*** Tanya and Danielle make use of searching the internet for scientific evidence to improve their knowledge and understanding in classifying certain terminology used in the NICU, high care and KMC units, as well as what factors would influence an infant's medical and functional prognosis once they are discharged. *'I've been just researching a lot in terms of what would be high-risk babies and looking at things like what would be classified as early, as a pre-prem those classification type of definitions and low birth weight and how do you decide which ones to put on and which*

	ones not to put on. That was just a lot of research on the internet and looking at what might be found to be children with problems later.' ***(Tanya)*** *'I generally check online but apart from the books; online- whenever I need to look something up, I do. I don't think my notes 20 years later are still current.'* ***(Danielle)*** An online platform that Lisa found useful to acquire information on neonatal care was NANT (Neonatal Association of Neonatal Therapists). This platform is open freely to all rehabilitation professions to access information. *'The other really useful platform that I found was NANT which is an American organization which is the Neonatal Association of Neonatal Therapists which is open to speech therapists, physiotherapists, and occupational therapists; that was an incredibly useful source.'* ***(Lisa)***
Synthesising knowledge to work in OT neonatal practice	Jane synthesises the knowledge she acquires by using her own clinical reasoning to make sense of the information that she finds. *'I think it comes down to your clinical reasoning at the end of it, there's so much information out there, you wanna use your clinical reasoning in addition to the information you gather to provide the best possible treatment.'* ***(Jane)*** Lorna and Pat who work in smaller district facilities use all the information that they have accessed from various sources and synthesise it through trial and error in intervention with patients to observe what is useful and what is not**.** *'I would say for myself because I'm still a newbie it's more trial and error honestly, it's more trying things out and seeing what works for specific patients or specific case and seeing from there.'* ***(Lorna)*** *'Based at a district hospital seriously it's trial and error and finding out what works for other people and trying out and seeing if it works for me.'* ***(Pat)***
Acquiring knowledge from policies and protocols	Ashley acquires information from policies that have been implemented from the KZN Department of Health. Within this policy is a checklist that the nurses who work in the NICU, high care and KMC units must fill out. Ashley has benchmarked on this policy and has adapted it to use within her own department to identify high risk infants.

	'With the new policy that's come into neonatal to try lower litigation against the department of health, there's that checklist that the nurses have to fill in. and if you go through the checklist, a lot of the factors that we have had on our form are now also on that checklist. It is in our policy now and when I started there was no such thing as a neonatal check list, so there definitely are those guidelines to say if the baby isn't checking these boxes- that's a red baby, orange baby or a green baby and that's all from that new neonatal nursing care checklist." ***(Ashley)*** Tanya like Ashley believes that the guidelines provided by the KZN Department of Health are comprehensive in identifying and providing information on an infant that is or has potential of being classified as high risk. *'The current guidelines are so more complete than what it used to be, so I think it should all be there and that should be a guideline for identifying who should we look at.'* ***(Tanya)*** Ashley has indicated that after some members of the MDT attend the Little Steps course, they provide in service training to other members of the MDT from various disciplines. Together they develop a policy to implement in their nursery. They review this protocol as a team every year. *'After you go on your little steps training and you discuss, we do have in-services within the MDT and we make sure that we include the dietetics, the audiologists to do the screening of the hearing, the OTs, the speeches and we write up a protocol with the doctor that works in the nursery and we review that protocol every year.'* ***(Ashley)***
THEME 3: KNOWLEDGE TRANSLATION/UTILISATION	
Ethical practice in the NICU	Ben believes that what works for him is having a good understanding of anatomy and physiology to make sense of the infant's diagnosis. This allows him to provide safe interventions that will not do harm to the infant. He believes that ethics plays an important role as you should not intervene when it is not necessary and that a therapist should be confident and passionate when working with high risk infants. *'What works for me is to understand the anatomy and physiology to understand this new born that you are working with, to know if you're doing some sort of intervention, are you not gonna hurt the baby and what also helps is knowing ethics, what to do and what*

	not to do at a certain time so having confidence in what you're doing and being passionate for the lives that you are that you are working with.' ***(Ben)*** Lisa agrees with Ben in terms of putting ethical practice first. If you are not sure of what interventions to implement, you could put the infant at risk of harm. This is contrary to what Lorna and Pat have said previously in using trial and error in implementing interventions with infants. This may be viewed as unethical practice. 'I think especially the ethics, first do no harm and if you're not sure actually not to intervene because you could put a child at risk.' **(Lisa)**
The inhibitors and facilitators in sustaining knowledge	Lisa believes that medical personnel in district facilities may be viewed as inhibitors in sustaining knowledge in neonatal care. She attributes this to frequent staff rotations and meetings amongst medical staff do not prioritise rehabilitation intervention in the NICU, high care and KMC units. *'From my experiences in district hospitals I find it more difficult to get buy in from medical staff. You know doctors are rotating the whole time and you're trying to play catch up and their doctor meetings are not- the focus on rehab and intervention is not as strong.'* ***(Lisa)*** Ben agrees with Lisa as he believes that the doctors in district facilities are inexperienced in the field of neonatal practice, and therefore they do not refer high risk infants to OT. *'With district hospitals that the doctors are still inexperienced and at times they miss what they need to refer to us.'* ***(Ben)*** Ashley is employed at a district hospital and finds like Lisa that medical personnel rotate often. She believes in putting OT in the medical in service roster to educate them on the OTs role in the care of the high risk infant, as well as when to refer and what programmes are offered to monitor the development of high risk infants on discharge. Providing consistent in-service training acts as a facilitator in sustaining knowledge in facilities.

	'I work in a district hospital and we have a rotational system in our wards where doctors change every four months, so put yourself in that in-service roster, make sure they know about the high-risk baby program, make sure they know who to refer, when to refer, what to refer.' ***(Ashley)*** Lisa provided in service training to nurses employed in the NICU, high care and KMC units as well as to medical interns who rotated through their paediatric block. This training was consistent with all intern rotations throughout the year. She believes that this was a facilitator in sustaining knowledge in neonatal care practices within the MDT that became a standard of care in the paediatric departments operational system. '*We did in-service training with our nurses on how to implement some of the care practices, we also did in-service training with every single intern-medical-intern that was coming through, so that everyone in the team is aware of how to implement your therapeutic approaches so it's not just therapy and it becomes the base standard the entire system runs on.'****(Lisa)*** Tasha agrees with Lisa in creating an in-service roster for doctors, to sustain and promote their understanding of the role of OT in the care of the high-risk infant. This may assist in them building a trusting relationship with the OT department and accepting OT as a valuable member of the MDT. Tasha also believes that getting the medical manager on board may assist in sustaining knowledge transfer of the OTs role in the care of the high-risk infant amongst the paediatric medical team. *'Setting up an in-service roster for doctors and just also kind of getting your presence known and that same thing kind of showing them that you do know what you're doing to gain their trust in a team. The medical manager can really help filter down that information to their doctors.'* ***(Tasha)*** Jane believes that a facilitator in sustaining knowledge of the OT's role in neonatal intervention is using scientific evidence to prove to the hospital management that OT interventions may assist the facility in decreasing costs. 'If you show anything that's evidence-based practice, how you will be saving money with OT interventions, you're winning somewhere.' **(Jane)** Lorna believes that training and educating the operational managers of the NICU, high care and KMC units play's a crucial role in sustaining knowledge of neonatal care amongst the nursing staff.

	'The OMs in the wards are very, very helpful so empowering them is far more helpful, more than putting up posters about high-risk babies and what we do; it does help to a certain extent but I think sharing skills and empowering people that is much more sustainable and much more ideal I would say.'**(Lorna)**
Sustaining knowledge through the family unit	Lisa perceives the parent role in the NICU, high care and KMC units as being important in sustaining knowledge in the care of the high-risk infant, as they are constantly with the infant during admission in the unit as compared to OT and the rest of the MDT. She believes in educating the parent individually or in groups and adapting intervention to the specific needs of the infant and parent dyad. She also ensured that the MDT working in the units sustained education and intervention strategies through the parent. *'So another thing that was done was a lot of work with the parents one-on-one as well as in groups and then seeing how you can adapt your care approach specifically to the parents' needs and how is that best going to achieve a dyadic approach in that moment, how best you're going to get the child and parent to work together.'* ***(Lisa)*** *'At the end of the day it's one therapist, it's a handful of nurses, and it's a handful of doctors but mom or dad are there all the time, so I think a lot of the adapting we did was parent focused and making sure that the whole team is on board in whatever capacity we could have done it in.'* ***(Lisa)*** Ashley like Lisa also believes in intervening early and educating the parent on intervention strategies as well as what to expect whilst being admitted in the unit and after discharge. *'So, getting in there early, doing early education with the mom, discussing the program, what it's going to do, supporting the mom, talking, and on-going support of that mom up until the day she leaves the hospital.'* ***(Ashley)***
Sustaining knowledge through CCGs	Lorna who is employed at a district hospital promotes the sustainment of knowledge by educating the community health workers on identifying a high-risk infant and on rehabilitation strategies in neonatal care to empower them at a community level. This also allows for them to be able to identify high risk infants in the community and refer them to the hospital if it is indicated. *'I work in a district hospital so we work very closely with CCGs in our hospital so even taking that information that we learn on how to care for neonates or high-risk babies and empowering them as well, for them to be aware of what to look out for, if you see these*

	signs maybe advise the mother, gogo or anything like that to come to the hospital to get assistance and sharing the importance of rehab intervention.' ***(Lorna)*** Ashley like Lorna believes in sustaining knowledge through community health care workers by educating them on identifying children who may be developmentally delayed in the community and referring them to the facility's high-risk program. *'Speak to your community caregivers about when they are doing community rounds if they find children who are developmentally delayed, send them to the high-risk baby program, that's how we trace a lot of our defaulters through those ladies and those workers.'* ***(Ashley).*** She utilises the services of the community workers by '*making detailed directions so that the community caregiver can go and find that defaulter if need be, especially if it's a worrying baby that defaulted due to NNE.'* ***(Ashley).*** This allows for parents of high-risk infants that default the high-risk baby program to be located and referred to the facility.
THEME 4: CONTEXTUAL BARRIERS AND ADAPTATION	
Adapting to the contextual needs of the facility and community	Lisa engages with her past and present knowledge and experiences and combines it with scientific evidence to develop and adapt intervention strategies to her specific context. She indicates that most research in the field of neonatology comes from first world countries and may not suit the South African context. *'Strategies change but I think there's always ways of drawing on past knowledge, past experience and then in combination with latest research to develop something that works for your context because a lot of the research is also based in first world countries, so to develop that and alter and adapt that to suit our context.'* ***(Lisa)*** Jane like Lisa also believes that most research in neonatal care come from first world countries, and that the current resources of the facility that a therapist is employed in needs to be considered to adapt to a South African context. *'You also need to consider the resources at your institution because a lot of the research that comes out is from first world countries and we don't always have those kinds of resources. So, it's always nice to see what they are using and try to think out the box and how we can use a similar sort of idea to get the same result.' (**Jane)***

	Ciara has developed education pamphlets for parents and caregivers at her facility to cater for both the majority of IsiZulu and English speakers who access public health care in the KZN province. *'One of the things we've done at our hospital is that we've put together like an education pamphlet for parents so we've tried to make them in English and Zulu so they are accessible to most of our population.'* ***(Ciara)*** Tasha who is employed at a tertiary institution prioritises what information should be given to a parent or caregiver as they are not admitted for long periods of time; she believes that selecting the most applicable information to hand over to the parent comes with experience. *'Because we're tertiary and we not retaining these kids for a long period of time, kind of being able to prioritize what you hand over to the caregiver and that comes with a bit of practice as well because you want to help the mom as much as you can and give them as much but sometimes I find that less is more.'* ***(Tasha)***
Poor Referrals from the MDT	Tara indicates that although doctors rotate every few months at the facility, some do not acknowledge or understand the OT role in neonatal practice even if there is a continuous in-service training program. Therefore, they do not refer high risk infants to OT. *'I think the doctors that we work with do rotate but most of the time they are there for like 2/3 months, so depending on the doctors- some of the doctors don't really work close with rehab at all. You trying to maybe inform them that this is what OT does and this is how we can actually play a role they still for whatever reason generally don't refer.'* ***(Tara)*** Ben believes that doctors placed at district facilities are inexperienced in the field of neonatology and do not refer high risk infants to OT. *'With district hospitals that the doctors are still inexperienced and at times they miss what they need to refer to us.'* ***(Ben)*** Tasha outlines that poor referrals from the medical staff in paediatrics may be attributed to fear of OT intervention in the NICU. This may be due to a knowledge gap with medical staff in understanding the benefits of NDSC in the NICU and early intervention. She

	suggests that educating the medical manager on the role of OT in the NICU, may assist in filtering information on the role of OT to the doctors in paediatrics. *'A lot of the times, I'm sure your involvement of your team will be blocked mainly because of fear of what we're gonna do there, and if you don't have an in there, sometimes your medical manager- by educating your medical manager- he can help filter down the importance of your role within the NICU as well.'* ***(Tasha)***
Typical day in the NICU, high care and KMC units	Lisa and Ashley describe an average day in the NICU as being busy, short and chaotic due to working around the sleep and wake states of the infant or the parent/caregiver not always being present. Ashley feels that the NICU and KMC units have a nice environment as the MDT are supportive and there is continuous training amongst staff on neonatal care practices. *'I think short and chaotic summarizes it for me, you go in there and this baby is sleeping and the other one is deep quiet sleep and you can't interact with that one and you move to the next one but mom is showering and then you're here and then you're there, so it often felt quite chaotic.'* ***(Lisa)*** *'It is usually quite busy in the morning but it is a nice environment for me to work in because the team is very supportive and there's a lot of training that goes on and it's constant, it's a good experience for me to work in there in the nursery and in the KMC wards.'* ***(Ashley)*** Lisa describes most of the hospitals in which she has worked at have attempted to implement systems with regards to continuous education with parents and caregivers in various units in which there were high risk infants as well as healthy infants admitted. Education was done with parents and caregivers daily in the form of classes, groups and individual education. This consisted of a typical day in the NICU, KMC or post-natal wards. *'I think at all the different hospitals that I've worked in we've certainly tried to implement some form of system particularly around education, so having particular designated times to do specific classes, education sessions and in the district hospitals I worked in we were going bed to bed in the entire maternity ward every single day, working with both your high risk and sort of normal deliveries.'* ***(Lisa)*** In a typical day Ben engages with nursing staff in the NICU to obtain medical and social information about the infant and parent before assessing the infant physically. He acquires further information about the child from the RTHC and from the doctor.

	'We first talk to the nurse to find the background information on the mom and the child and then we assess the reflexes, we also assess the child's tone and we get to find out from the mom on her experiences through gestation and everything, and also we focus on the road to health card to look at the things that the doctors have commented upon, if there's a doctor on board we interview the doctor on the whole gestation period and what not.' ***(Ben)***
The infant and parent dyad	Nelly emphasises the care that is needed in handling the high-risk infant in the NICU. *'Handling the babies, it needs a lot of care, you need to take that care to handle the babies.'* ***(Nelly)*** Alex describes how she takes the time to assess the parent's mental capacity before providing education about the infants diagnosis, as the parent or caregiver may already be feeling very overwhelmed with the child being admitted and unwell. *'We also just look at how, reading into how the parent or caregiver is because it doesn't help educating them about this vast condition, when it's overwhelming already for them that the child has this condition.'* ***(Alex)*** Ashley describes one of the high-risk factors is young mothers. She describes providing support, early education on caring for a new-born, education on the high-risk programme, and breastfeeding education to the young mothers so that they can cope and take care of the infant. *'One of our high-risk factors is a young mom getting in there early, doing early education with the mom, discussing the program, what it's going to do, supporting the mom, getting the breastfeeding and the latching, the feeding right because a lot of the times they have issues with breastfeeding.'* ***(Ashley)***
THEME 5: THE IDEAL OT AND NEONATAL SETTING/CONTEXT/ENVIRONMENT	
The ideal OT in neonatal practice	Tasha describes the NICU as being an overwhelming environment. She believes that the ideal therapist working in the NICU must be a confident person who is knowledgeable in the field of neonatal care. The therapist must also have an assertive personality to be able to engage with nurses and doctors to facilitate change.

	'The NICU is already such a scary place, you really need a therapist that's confident, that knows what they're doing but not just knows what they're doing with the babies and can also address nurses and doctors without feeling intimidated because to do anything substantial in the NICU you need to get your buy in, you can't do it alone.' ***(Tasha)*** Anne describes the ideal OT for the NICU as being patient, compassionate and educated in the field of neonatal care. She does not believe that a community service therapist should work in the NICU. She views working in the NICU as being a 'specialised" field of practice in OT, and the person working there should have adequate training and experience. *'I think a very patient, compassionate and an educated person in that field. I don't think your comm serve is the person that should be in that space. The person must be trained, neonatal ICU in my view is a specialised field and I don't think that comm serves can actually work there because if you are starting, you need to first understand the environment you are working in.'* ***(Anne)*** Ashley describes the ideal OT for the NICU as being passionate, open and strong willed. Like Tasha and Anne, she also believes that the OT needs to be trained, which may increase confidence to provide intervention in the NICU. *'I think someone that is open, strong willed and passionate. Also, there needs to be some training behind that person and that I think is more valuable in making them more confident.'* ***(Ashley)*** Lisa indicates that if the undergraduate training for working with high risk infants was comprehensive, then occupational therapists may feel more equipped to work in the NICU. Like Ashley she describes the ideal OT for the NICU as being passionate and interested in working with neonates. She further describes the ideal OT as being someone who is gentle yet assertive and has good communication skills to engage with the MDT and parents. *'I think if we had a richer training system that would contribute more into having decent therapists. I think the other thing is passionate therapist, someone who is actually interested in it; you don't want someone who is half-hearted in the NICU, it's very emotionally intense work, it's very draining work so I think you need someone with gentleness with an equal thick skin. I think someone who can work as well with your neonates as well as your parents, a lot of communication skills with your staff.'* ***(Lisa)***
	Lisa describes the ideal day for an OT working in the NICU as having a good working relationship amongst the MDT, as well as having the time and flexibility to be able to structure your own day in the NICU.

The ideal day for OT practice in the NICU/high care.	*'I think the ideal day would include proper team connection, as well as just the time to be flexible and fluid in who you see and when.'* ***(Lisa)*** Jane also describes the ideal day for the OT working in the NICU is to be present for the entire MDT ward rounds. 'Ideally if we had time it would be so nice to be on the entire ward round with the doctors, nurses and the team.' **(Jane)** Currently OT departments in the KZN public health sector are short staffed which does not allow for therapists to be full time in the NICU, high care and KMC units. This prevents therapists from working flexibly and being fully present daily.
The ideal toolbox for the OT in neonatal practice	Tanya thinks that the ideal toolbox should include protocols for OT working in the NICU, that are based on scientific evidence for various diagnoses. *'I think it will be useful to have well researched protocols which might need to be still adjusted for each environment but to have like a basic outline of what to do for a club foot, for hydrocephalus, and what to look for and those things.'* ***(Tanya)*** Lisa thinks that the ideal toolbox should include standardised South African assessment tools that applies to the context and population group of the country. She believes that the data from a South African standardised assessment can be utilised to develop research within the South African context in OT and neonatal care. Lisa would like the ideal toolbox to also have a room that would be allocated solely for family and parent counselling *'I think what I would really like in the toolbox is a South African assessment that is sensitive to our population and we can really start using that to generate our own data and to stand our ground on an international level in terms of research.'* ***(Lisa)*** *'The opportunity to have a family room or counselling room would be really nice.'* ***(Lisa)*** Jane indicates that it is difficult for her and other occupational therapists who have not had further training in working with high risk infants to identify what the ideal toolbox should consist off as compared to therapists who have received further training. *'I think it's quite hard for us who haven't had further training in high-risk babies, it's hard for us to say what would be ideal whereas a person who has had that training may have a lot of things they would thing would be most beneficial to kids.'* ***(Jane)***

	Danielle would like the ideal toolbox to have reading resources for the parent to take home to engage with in their own time without being burdened with the overwhelming NICU environment. *'I think if you also had reading material for the mom, so you can take it home and read it in your own time and in your own space without being overwhelmed.'* ***(Danielle)***

APPENDIX K: Reflection

I had always had an interest in preemies and high-risk infants from the start of my community service year. I was fortunate enough to have supervisors that had an interest in neonatal care. I learnt and developed my skills through hospital in service training and practically intervening with high-risk infants in the NICU, High care, KMC units and our follow up high risk baby clinic. I eventually attended neurodevelopmental supportive care (NDSC) training in 2016 to further my knowledge and skills in the therapeutic management of the high-risk infant and family. I am currently completing my infant sensory integration training to better understand the sensory needs of infants and toddlers.

Having a background in Occupational therapy and neonatal intervention resulted in having my own reasoning in what drew me to work with this specific population. As an insider in the study, validity and trustworthiness of the data was of utmost importance. During the instrument design the questions developed with supervisors of the research study were relatable in what I would have wanted to be asked if I was a participant in this study. Researcher insider bias was prevented as the instrument (interview schedule) was developed by the researcher, co facilitator and supervisors of this study. I knew where I acquired information to work with neonates – courses, journals, books and experienced colleagues. This sparked an interest in wanting to know how other therapists sourced information and synthesised their knowledge for practice in the public health sector of KwaZulu-Natal. During the research discussions I felt that I also wanted to contribute and had opinions and ideas of my own to share from my personal experiences. However, knowing that I was the researcher in this study, I kept my presumptions, beliefs, and opinions to myself and did not contribute to the discussion but was rather a facilitator in encouraging therapists to share their experiences in working with neonates. It was observed that there was a gap in acquiring a standardised source of knowledge and skills for therapists who intervened with neonates in the public health sector of KwaZulu-Natal. Therapists sharing their knowledge on utilising trial and error interventions made me want to express how this could be dangerous to the neurodevelopment of the high-risk infant, however I was not biased as a researcher and did not share my opinion. This did make me realise the need for this study. Through online ZOOM discussions it was difficult to observe the body language of two participants as they were unable to switch on their cameras due to poor internet connectivity. Through the tone of their voices, it was noticed that many of them were passionate about sharing their opinions, beliefs, and ideas. There were times where participants did not use the raise hand function and spoke at the same time. The co-facilitator and I directed participants so that they all had a turn to speak. Data and findings of the study were reviewed by peer debriefing and continued triangulation to ensure validity and trustworthiness to prevent insider bias. The need of exploring the perceptions and knowledge

gaps of occupational therapists in the province with regards to neonatal care drew me to this research study and the importance thereof in influencing change in the care of the high-risk infant.

APPENDIX L: Ethics Approval 1

KWAZULU-NATAL PROVINCE

HEALTH

REPUBLIC OF SOUTH AFRICA

DIRECTORATE:

Postal Address: Private Bag X9050
Physical Address: 330 Langalibalele Str; PM Burg; 3201
Tel: 0333953189/3123/2805 Fax: 033-3943782
Email address: hrkm@kznhealth.gov.za
www.kznhealth.gov.za

Health Research & Knowledge Management Unit

NHRD Ref: KZ_202008_066

Dear Prof P Govender (UKZN)

Approval of research

1. The research proposal titled 'Bridging the knowledge-to-practice in rehabilitation professionals working with at-risk infants in the KwaZulu-Natal public health sector' was reviewed by the KwaZulu-Natal Department of Health (KZN-DoH). The proposal is hereby approved for research to be undertaken at the selected facilities at KZN-DoH.

2. You are requested to take note of the following:

a. All research conducted in KwaZulu-Natal must comply with government regulations relating to Covid19. These include but are not limited to.' regulations concerning social distancing, the wearing of personal protective equipment, and limitations on meetings and social gatherings.
b. Kindly liaise with the facility manager BEFORE your research begins in order to ensure that conditions in the facility are conducive to the conduct of your research. These include. but are not limited to, an assurance that the numbers of patients attending the facility are sufficient to support your sample size requirements, and that the space and physical infrastructure of the facility can accommodate the research team and any additional equipment required for the research

c. Please ensure that you provide your letter of ethics re-certification to this unit, when the current approval expires
d. Provide an interim progress report and final report (electronic and hard copies) when your research is complete to HEALTH RESEARCH AND KNOWLEDGE MANAGEMENT, 10-102, PRIVATE BAG "9051, PIETERMARITZBURG, 3200 and e-mail an electronic copy to hrkm@kznhealth.gov.za
e. Please note that the Department of Health shall not be held liable for any injury that occurs as a result of this study.

For any additional information please contact Ms G Khumalo on 033-395 3189.

Yours Sincerely

Dr E Lutge

Chairperson, Health Research Committee

Date: 31/08/2010.

GROWING KWAZULU-NATAL TOGETHER

APPENDIX M: Ethics Approval 2

UNIVERSITY OF KWAZULU-NATAL
INYUVESI YAKWAZULU-NATALI

Prof Pragashnie Govender (621544)
School of Health Sciences
Westville

Dear Prof Govender,

Protocol reference number: BREC/00001886/2020
Project title: Bridging the knowledge-to-practice gap in rehabilitation professionals working with at-risk infants in the KZN public health sector
Degree: Non-Degree

PROVISIONAL APPROVAL – Expedited Application

A sub-committee of the Biomedical Research Ethics Committee has noted and considered your application received on 09 September 2020.

The study is given PROVISIONAL APPROVAL subject to a satisfactory response to the following queries:

1. The PI is also the supervisor on the application. Please clarify. Is this study for degree purposes?
2. Considering the duration of time the participants will be required for, reimbursement as per SA DoH TIE guidelines should be considered.
3. Please elaborate on how recruitment will be done. How will participants be contacted?
4. Where will the workshops be held?
5. Please include all contact details on the consent forms - please use BREC templates and edit was required.

Only when full ethical approval is given, may the study begin. Full ethics approval has not been given at this stage. PLEASE NOTE: Provisional approval is valid for 6 months only – should we not hear from you during this time – the study will be closed and reapplication will need to be made. Your acceptance of this approval denotes your compliance with South African National Research Ethics Guidelines (2015), South African National Good Clinical Practice Guidelines (2006) (if applicable) and with UKZN BREC ethics requirements as contained in the UKZN BREC Terms of Reference and Standard Operating Procedures, all available at http://research.ukzn.ac.za/Research-Ethics/Biomedical-Research-Ethics.aspx.BREC is registered with the South African National Health Research Ethics Council (REC-250408-009). BREC has US Office for Human Research Protections (OHRP) Federal-wide Assurance (FWA 678).

Yours sincerely

Ms A Marimuthu
(for) Prof D Wassenaar
Chair: Biomedical Research Ethics Committee