



# **OCCUPATIONAL THERAPY INTERVENTIONS FOR SLEEP DISORDERS AMONGST CHILDREN IN SOUTH AFRICA**

**by**

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Witwatersrand, Johannesburg, in fulfilment of the requirements for the degree of Master  
of Science in Occupational Therapy

Under the supervision of Olindah Silaule

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## **DECLARATION**

I, Alicia Myburgh, declare that this dissertation is my own work. It is being submitted for the degree of Master of Science in Occupational Therapy at the University of the Witwatersrand, Johannesburg. It has not been submitted before for any degree or examination at this or any other University.

Signature: .....

Date: .....

## **DEDICATION**

This study is dedicated to my husband, Hendrik Grobler; my mother, Theresa Myburgh; and my brother, Christopher Myburgh for their unwavering encouragement and encouragement during the completion of my research.

## ABSTRACT

An increase in the incidence of sleep disorders amongst children has placed a significant demand on occupational therapists to provide interventions to address interruptions in sleep. The overall aim of this study was to describe the current occupational therapy (OT) practice for sleep in children.

A quantitative, cross-sectional survey design was used to gather information on the profile of occupational therapists providing sleep interventions to children in South Africa (SA); the current practice for sleep interventions; and the training. *The Occupational Therapy Health Literacy Skills for Pain and/or Sleep Disorder Survey*, by Brown, Swedlove and Berry (2012) was adapted for use in SA. This standardised survey was set up on REDCap, distributed via various online platforms. Descriptive statistics were analysed through the Statistical Package for Social Sciences (IBM-SPSS -V23) programme.

The sample size for this study was set at 105. Hundred and thirty responses were received and 118 met the inclusion criteria. Respondents estimated that over a quarter of their caseload experienced sleep disorders. However, limited number offered OT sleep interventions for children. Insufficient training, limited assessment/treatment tools, and time; were identified as barriers to provision of sleep interventions for children.

The results of the study revealed the importance of ...Therefore, it is recommended that undergraduate OT courses in SA include basic theory and knowledge regarding sleep and sleep interventions.

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## LIST OF ABBREVIATIONS

|        |                                                                                                                     |
|--------|---------------------------------------------------------------------------------------------------------------------|
| ADHD   | Attention-Deficit/Hyperactivity Disorders                                                                           |
| AOTA   | American Occupational Therapy Association                                                                           |
| ASD    | Autistic Spectrum Disorders                                                                                         |
| BEARS  | B=Bedtime Issues, E=Excessive Daytime Sleepiness, A=Night Awakenings, R=Regularity and Duration of Sleep, S=Snoring |
| BISQ   | Brief Infant Sleep Questionnaire                                                                                    |
| CBT(i) | Cognitive Behavioural Therapy (Insomnia)                                                                            |
| CSHQ   | Children's Sleep Health Questionnaire                                                                               |
| CPD    | Continuous Professional Development                                                                                 |
| DD     | Developmental Disorders                                                                                             |
| FASD   | Foetal Alcohol Spectrum Disorders                                                                                   |
| HPCSA  | Health Professions Council of South Africa                                                                          |
| NREM   | Non-repetitive eye movement                                                                                         |
| ODD    | Oppositional Defiant Disorder                                                                                       |
| OT     | Occupational Therapy                                                                                                |
| PEOP   | Person-Environment-Occupation-Performance                                                                           |
| PSE    | Prenatal Substance Exposure                                                                                         |
| REM    | Rapid Eye Movement                                                                                                  |
| RuReSA | Rural Rehabilitation of South Africa                                                                                |
| SA     | South Africa                                                                                                        |
| SADAG  | South African Depression and Anxiety Group                                                                          |
| SAISI  | South African Institute of Sensory Integration                                                                      |
| SI     | Sensory Integration                                                                                                 |
| SMD    | Sensory Modulation Disorder                                                                                         |
| SPD    | Sensory Processing Disorder                                                                                         |

## NOMENCLATURE

| Term                                     | Definition                                                                                                                                                                                                                                                                                                                                                                                 |
|------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Attention-deficit/hyperactivity disorder | A chronic condition characterised by difficulties in attention, hyperactivity, and impulsivity (Hiscock, et al., 2015).                                                                                                                                                                                                                                                                    |
| Autistic spectrum disorder               | A developmental disorder that influences both communication and behaviour. ASD can be diagnosed at any age, but it is listed under the “developmental disorders” because symptoms typically begin in the first two years of life (Case-Smith & Arbesman, 2008).                                                                                                                            |
| Child                                    | A human being below the age of puberty or below the legal age of majority (Oxford Languages, 2007). The South African Children’s Act, 2005, Article One defines “child” as a person below 18 years (South Africa, 2006).                                                                                                                                                                   |
| Infant                                   | An infant is defined as a very young child or baby (Oxford Languages, 2007). In South Africa, the national department of health defines an infant as ‘a child under the age of one year; more specifically, a new-born baby’. (The National Department of Health, Republic of South Africa, 2012).                                                                                         |
| Prematurity                              | An infant who is born alive before the typical 37-weeks of pregnancy have passed. Preterm birth is further placed into sub-categories, based on gestational age: extremely preterm (> 28 weeks) very preterm (28 to 32 weeks) moderate to late preterm (32 to 37 weeks) (Howson, Kinney & Lawn, 2012)                                                                                      |
| Prenatal substance exposure              | Foetal exposure to maternal drug and alcohol use that can significantly increase the risk for developmental and neurological disabilities in the child. Such exposure can cause severe neurological damage and growth retardation in the substance-exposed new-born (Olson, et al., 2007).                                                                                                 |
| Sensory processing disorder              | A condition that influences the brain’s ability to process sensory input. Sensory input includes vision, hearing, olfaction, gustation, movement, proprioception and tactile input. This processing disorder results in over- or under-sensitive to typical sensory input (Ayres, 1996).                                                                                                   |
| Sleep                                    | Sleep, as defined by occupational therapy literature, comprises of both sleep preparation and sleep participation (AOTA, 2014, p. S20):<br><br>“Sleep preparation is an individual’s routine that helps to prime their body and mind to rest. It is defined as: <i>(1) Engaging in routines that prepare the self for a comfortable rest, such as grooming and undressing, reading, or</i> |

|                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
|--------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                    | <p><i>listening to music to fall asleep, saying goodnight to others, and engaging in meditation or prayers; determining the time of day and length of time desired for sleeping and the time needed to wake; and establishing sleep patterns that support growth and health (patterns are often personally and culturally determined). (2) Preparing the physical environment for periods of unconsciousness, such as making the bed or space on which to sleep; ensuring warmth or coolness and protection; setting an alarm clock; securing the home, such as locking doors or closing windows or curtains; and turning off electronics or lights.</i></p> <p>Sleep participation is defined by the Occupational Therapy Practice Framework: Domain &amp; Process (AOTA, 2014, p. S20) as: <i>Taking care of personal needs for sleep, such as ceasing activities to ensure onset of sleep, napping, and dreaming; sustaining a sleep state without disruption; and performing night-time care of toileting needs and hydration; also includes negotiating the needs and requirements of and interacting with others within the social environment, such as children or partners, including providing night-time caregiving such as breastfeeding and monitoring the comfort and safety of others who are sleeping.”</i></p> |
| Sleep disorder     | Changes in sleeping patterns or habits that negatively affect health (Bruni & Novelli, 2010).                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| Sleep intervention | Intervention is an action taken to improve a medical disorder i.e., a sleep disorder in this case (Brown, et al., 2012).                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |

## **CHAPTER 1. INTRODUCTION**

### **1.1 Background of the study**

Daytime functioning and quality of life is linked to sufficient sleep for all humans (Buysse, Yu, & Moul, 2010). Meyer (1922) has described sleep as one of the 'big four' elements necessary for health and balance – along with work, play and self-care. For infants and children, sleep is critical for cognitive and physical development. During early childhood sleep is required for critical brain maturation processes which are relevant for the development of healthy cognitive and psychosocial functioning (Guyer, Huber & Fontijn, 2015; MacDuffie et al., 2020). Sleep maximises cognitive functioning, memory consolidation, socio-emotional and physical development, and communication (Tononi & Cirelli, 2006; Tucker & Fishbein, 2009;). Fung, Wiseman-Hakes and Stergiou-Kita (2013) have confirmed that adequate sleep is associated with improved day-time communication, behaviour, and cognition. It is for this reason that the majority of the first year of life is spent in sleep (MacDuffie et al., 2020).

The American Occupational Therapy Association (AOTA) recognises sleep as an important occupation within the domain of occupational therapy (OT) practice for children (Fung, et al., 2013; AOTA, 2014). Sufficient sleep in children is directly related to appropriate development and occupational performance making it a critical aspect of a child's routine and functioning (Fung, et al., 2013; Hirshkowitz, Whiton, & Albert, 2015). Links between sleep disruptions and behavioural disturbances in children have been highlighted. When sleep is continuously disrupted, children exhibit maladaptive emotional and social behaviour (Green, 2008; AOTA, 2014). Additionally, decreased learning ability, increased familial discord, and health deficits have been highlighted (Meltzer & Montgomery-Downs, 2011; Polimeni, Richdale & Francis, 2007). These disturbances result in learning and social difficulties, as well as a decreased ability to react to stimuli (El-Sheikh & Buckhalt, 2015; Luginbuehl & Kohler, 2009; Polimeni, Richdale & Francis, 2007). Sleep disruptions can evolve into sleep disorders if not intervened early enough, resulting in continuous disrupted sleep (Green, 2008). Childhood sleep disorders can also continue into adolescence and adulthood, and are linked to substance abuse, aggression, and adult psychiatric disorders (Brown, Swedlove & Berry, 2012; Luginbuehl & Kohler, 2009). However, sleep is rarely assessed within occupational therapy, and a practice gap exists (Fung, et al., 2013)

Internationally, a high prevalence of sleep disorders amongst children is reported (Chawla & Heussler, 2016; Tucker & Fishbein, 2009; Ward, Rankin & Lee, 2007). Specifically, in the United States of America, poor ability to sleep is counted among the main health concerns raised by parents when seeking healthcare (Ward, Rankin & Lee, 2007). Research has established that 25% of children, aged 0 to 5, may experience an acute or chronic sleep disorder (Chawla & Heussler, 2016; Davis, Parker & Montgomery, 2004; Tucker & Fishbein, 2009; Ward, Rankin & Lee, 2007). The term 'chronic' refers to prolonged conditions which develop slowly, and 'acute' refers to conditions which develop suddenly or last for a short length of time: such as days or weeks. Significantly, younger subjects present with more chronic sleep disorders (Alhola & Polo-Kantola, 2007).

Whilst the prevalence of sleep disorders amongst children is well-documented in developed countries such as the United States of America, the United Kingdom and Ireland; there is a paucity of evidence within developing countries. Currently, studies conducted on sleep disorders within developing countries focus solely on prevalence amongst adults. A study conducted by Stranges, Tigbe and Gómez-Olivé, (2012) in eight developing countries (South Africa (SA), Bangladesh, Ghana, Kenya, India, Indonesia, Tanzania, and Vietnam) revealed that 31.3% of women and 27.2% of men in SA suffer from some form of sleep disorder. Similarly, the SA Society for sleep medicine states that one in three South Africans attending the public health sector suffer from a sleep disorder (Bentley & Baker, 2011). While there is some evidence indicating the prevalence of sleep disorders in adults within SA, the prevalence of sleep disorders amongst children remains unknown. The lack of statistical analysis could be associated with the lack of awareness regarding sleep disorders and resultant delays in intervention (Guyer, Huber & Fontijn, 2015; Tucker & Fishbein, 2009).

Fung, Wiseman-Hakes and Stergiou-Kita (2013) state that interventions are available to improve sleep and manage the effects of sleep disorders. Regrettably, poor awareness regarding the prevalence of sleep disorders in children means that occupational therapists may overlook the effects of sleep on function. This could delay the correct diagnoses, management and treatment of these children. Delayed diagnoses have significant implications on development and occupational performance, including poor cognitive functioning and learning disorders, poor behavioural and emotional developmental, and poor sensory processing (Tononi & Cirelli, 2006; Tucker & Fishbein,

2009). Occupational therapists are uniquely equipped to improve cognitive functioning, learning ability, behavioural and emotional developmental, and sensory processing ability (American Occupational Therapy Association (AOTA), 2014). Thus, occupational therapists must understand the link between sleep and the conditions seen in the clinical setting to provide the appropriate intervention.

Occupational therapists provide interventions to improve sleep preparation, sleep participation, and rest for children with sleep disorders following their completion of an undergraduate degree (AOTA, 2020). These interventions are based both on traditional and unconventional approaches (AOTA, 2020; Christiansen & Baum, 2005; Green, 2008). Traditional approaches such as behavioural interventions are supplemented by pharmacological care (Malow, Adkins & Reynolds., 2014). Behavioural interventions include:

- family education;
- establishing predictable sleep routines;
- teaching behavioural techniques;
- addressing sensory disorders: and
- modifying the area (Salls, et al., 2002; Schaaf, et al., 2014; Coghill & Seth, 2015).

Unconventional approaches which are used to treat sleep disorders in children include the use of sensory integration therapy, such as the use of weighted blankets (Charleson, 2014). The benefits associated with these sleep interventions include an improved sleep cycle and alleviation of emotional stress for both the child and family unit (Luginbuehl & Kohler, 2009; Moturi & Avis, 2010).

The interventions described above are implemented within home and clinical settings, but an awareness of sleep and its relationship to day-time functioning is vital (Brown, Swedlove & Berry, 2012). A thorough assessment focusing on the various occupational performance domains, including sleep, is also required to implement sleep interventions (Brown, Swedlove & Berry, 2012; Fung, Wiseman-Hakes & Stergiou-Kita, 2013). In SA, however, a paucity of research on the intervention and use of sleep interventions for children with sleep disorders; and there is also a lack of literature to indicate appropriate assessments. The treatment approaches and techniques used to address sleep disorders in infants and children also remain unknown. In addition, limited evidence is to be found indicating the training received by occupational therapists to offer sleep



interventions to children (Bernard & Turk, 2009). Therefore, this lack of literature documenting the undergraduate and postgraduate training is likely to decrease the use and effectiveness of these interventions (Luginbuehl & Kohler, 2009; Moturi & Avis, 2010; Rogers, Trevisan, & Traxler, 2017). It is considered essential to include sleep and sleep interventions in undergraduate and postgraduate training (Bernard & Turk, 2009; Fallon, 2015).

This study, therefore, aims to describe current sleep interventions offered by occupational therapists in SA and to determine the extent of training they have received. All aspects of the study will be intended to add to the limited body of research evidence on the current occupational therapy practice with regards to sleep interventions for children within SA.

## **1.2 Problem Statement**

In consideration of the rise in sleep disorders in children it would appear that increased awareness and research regarding the interventions are needed (Mohan, 2017; Salls, Silverman & Gatty, 2002;). Without an awareness regarding sleep and its interventions, the underlying concerns might not be treated, leading to longer therapy periods and/or unreached outcomes (Fallon, 2015; Wiggs & Stores, 2004). Since there is limited evidence in SA regarding sleep interventions for children with sleep disorders (Jorge, de Witt & Franzsen, 2013), there is also limited documentation of the assessments used to identify sleep disorders and interventions that can be used to alleviate the effects of these disorders (Fung, Wiseman-Hakes & Stergiou-Kita, 2013; Jorge, de Witt & Franzsen, 2013). Additionally, owing to the limited evidence indicating the level of training received by occupational therapists in their undergraduate or postgraduate studies to offer such interventions (Bernard & Turk, 2009) the level of skills and competence possessed by occupational therapists in offering sleep interventions remains unknown (Bernard & Turk, 2009). Therefore, the overall focus of this study is to describe the sleep interventions offered by occupational therapists working with children presenting with sleep disorders and to determine what training was received regarding sleep disorders in children in SA.

## **1.3 Research Question**

Do occupational therapists provide interventions for children presenting with sleep disorders in South Africa, and what training have they received to offer these interventions?

## **1.4 Purpose of the Study**

The purpose of this research is to examine the understanding and knowledge regarding the occupational performance domain of sleep and sleep interventions for children among the OT population in SA. The benefits are that gaps can be identified in current OT sleep and sleep intervention training. This would allow training centres to revise their material to include OT sleep interventions for children and enable further OT research regarding the occupational performance domain of sleep to take place.

Furthermore, this research provides evidence on the effects of OT sleep interventions for children with sleep disorders. The results of this study would, additionally, improve the knowledge base for occupational therapists regarding sleep interventions for children in SA and provide occupational therapists with evidence to validate their role and scope in providing sleep interventions.

## **1.5 Aims of the Study**

To describe the sleep interventions offered by occupational therapists working with children presenting with sleep disorders in South Africa and determine the training occupational therapists received on sleep interventions for children

### **Objectives of the Study**

1. To determine the socio-demographic profile of occupational therapists currently providing sleep interventions to children with sleep disorders in SA.
2. To describe the awareness of sleep interventions provided by occupational therapists working with children in South Africa
3. To identify the sleep interventions provided by occupational therapists working with children in South Africa and the perceived effectiveness of this treatment.
4. To determine the training received by occupational therapists in South Africa in offering sleep intervention for children.

## **1.6 Justification for this Research**

Sleep is recognised as a critical occupational performance domain linked to physical, emotional, social, and cognitive development in children (Guyer, Huber & Fontijn, 2015; Tononi & Cirelli, 2006; Tucker & Fishbein, 2009;). However, while the importance of sleep is acknowledged in childhood development, a paucity of research indicating the unique contribution that occupational therapists have in the treatment and management of children with sleep disorders within SA exists (Green, 2008). The results of this study, therefore, highlight the current OT practice in addressing sleep disorders amongst children. Through this study the knowledge, assessments and interventions offered by occupational therapists to children suffering from sleep disorders in SA are established, therefore, generating evidence in this under-researched area of OT. The outcome of this study helps to raise awareness of the need for occupational therapists in the paediatric field of practice, to integrate interventions aimed at addressing sleep as a critical factor in childhood development. This is not only useful for occupational therapists to validate their role and scope in providing sleep interventions, but this study can be used as a basis for future research to challenge the effectiveness of the undergraduate and postgraduate OT training in preparing occupational therapists to offer sleep interventions.

## **1.7 Organisation of the Chapters**

**Chapter One:** This chapter provides an overview of the study and the reason for the study to have been undertaken. The research questions and purpose of the study are outlined. The aims, objectives and rationale for the study are then delineated.

**Chapter Two:** This chapter provides an overview of the literature for the study. It provides a detailed description of sleep as an occupational performance domain, describing the impact of sleep disorders on the interplay between the child and family unit. It then provides an overview of assessment and intervention strategies, with a specific focus on OT intervention. Lastly, it provides evidence for training in sleep for occupational therapists.

**Chapter Three:** Here the research design and methodology of the study are outlined. First, the research design and process used in obtaining a sample are outlined. The approach to analysis adopted by the study is then outlined, and a discussion of the

various strategies used to ensure reliability follows. The data-gathering tools and general research procedures are then discussed. The chapter ends with the ethical considerations implemented within the study.

**Chapter Four:** The results of the study are presented, in written and diagrammatic format. The demographic of the sample is described followed by the findings relating to the research objectives. The descriptive statistics collected through a REDCap survey are analysed through the Statistical Package for Social Sciences (IBM SPSS Statistics V23).

**Chapter Five:** The results written up in Chapter Four are discussed in this chapter, with reference to the literature outlined in Chapter Two. This chapter discusses the results of this study in the context of the available literature, interprets possible reasons for the results, and discusses their significance in the SA context. Recommendations based on the findings are made.

**Chapter Six:** Implications for future research and conclusions on the findings are presented in this chapter. Recommendations are made, such as the inclusion of basic theory and knowledge regarding sleep, and sleep interventions to be included in undergraduate OT courses in SA and increasing public/professional awareness regarding sleep disorders in children. A condensation of the researcher's personal reflexivity over the course of the study is presented and a conclusion for the study is written.

## **CHAPTER 2. LITERATURE REVIEW**

### **2.1 Introduction**

This chapter reviews the current literature to provide an introduction on sleep and sleep disorders in children. The occupational performance area of sleep is defined and the impact of sleep disorders on the child and family unit is explored. Sleep interventions, specifically those related to the assessments and treatments provided by occupational therapists in management of sleep disorders in children, are considered. Additionally, literature regarding the training of occupational therapists in the occupational performance domain of sleep, is investigated.

Various literature sources are reviewed, including Journal archives such as the American Journal of Occupational Therapy (AJOT), the Canadian Journal of Occupational Therapy (CJOT), the British Journal of Occupational Therapy (BJOT), Occupational Therapy Seeker, PubMed and ResearchGate. Although the search concentrated on sleep interventions across all health care disciplines the focus is on sleep interventions in the profession of occupational therapy. The search phrases used; included 'child(ren)', 'sleep and the family unit', 'sleep', 'sleep physiology', 'occupational therapy', 'sleep and occupational therapy', 'occupational performance areas', 'sleep disorder(s)', 'sleep dysfunction(s)', 'occupational therapy intervention(s)', 'sleep disorders seen in children', 'sleep disorder statistics', 'sleep interventions (and training)', 'occupational therapy training (with regards to sleep)', and 'South Africa'.

### **2.2 Sleep as an Occupation**

Medical research states that sleep is regulated by two neurobiological processes, the circadian rhythm and sleep homeostatic process (Davis, Parker & Montgomery, 2004; El-Shakankiry, 2011; Roth, 1996). The circadian rhythm is thought to regulate sleep and waking, and develops with age (Buysse, Yu & Moul, 2010; El-Shakankiry, 2011; Green, 2008; Najjar & Zeitzer, 2017). It is made up of autonomous physiological activities which result in 24-hour day/night cycles. The circadian rhythm is a non-static process that enables humans to adapt to fluctuating environment and is said to be influenced by social and environmental factors (Xie et al., 2019). In infancy and early childhood, the circadian rhythm is immature, irregular, and synchronised with feeding times (El-Shakankiry, 2011). As it develops into a mature rhythm in adulthood, it begins to

synchronise with light-dark cycles and sleep-and-waking routines (El-Shakankiry, 2011). The development of the circadian rhythm is central to functions such as core body temperature, endocrine hormone secretion, and sensory processing (El-Shakankiry, 2011; Jan, Reiter & Wasdell, 2009; Mistlberger & Rusak, 2005; Najjar & Zeitzer, 2017).

The homeostatic process is a progression which regulates the accumulative need for sleep. This process comprises of two sleep phases, namely rapid eye movement (REM) and non-rapid eye movement (NREM) sleep (El-Shakankiry, 2011). Synaptic connection formation reaches a peak during the REM phase (Guyer, Huber & Fontijn, 2015; Tononi & Cirelli, 2006; Walker, 2009). During the NREM phase of sleep, the synaptic connections formed during the REM phase are pruned. This means that significant connections are maintained, and insignificant ones are destroyed (Tononi & Cirelli, 2006). Much empirical evidence shows that the two neurobiological processes of sleep have an important part to play in cognitive, emotional, physical and social development, as well as the ability to function during waking hours (El-Shakankiry, 2011; Hirshkowitz, Whiton & Albert, 2015; Siengsukon & Boyd, 2009; Tucker & Fishbein, 2009; Walker, 2009).

As highlighted by El-Shakankiry (2011:101), “Infants and young children spend a majority of their time asleep” which confirms that sleep is important for brain and body development. Typically, children, aged 3 to 5, spend 11 to 12 hours asleep in a period of 24-hour (Guyer, Huber & Fontijn, 2015; Hirshkowitz, Whiton & Albert, 2015). As the child matures, an overall decline in sleep duration occurs, reducing to 10 to 11 hours in school-aged children (Guyer, Huber & Fontijn, 2015; Hirshkowitz, Whiton & Albert, 2015). The decline in sleep duration, and changes in the initiation and continuation of sleep, signifies the maturation of the circadian rhythm and homeostatic process (El-Shakankiry, 2011; Green, 2008).

In addition to the importance of sleep physiology in childhood development, occupational therapy (OT) literature considers the importance of sleep as an occupation. According to Meyer (1922:641) in the philosophy of occupation therapy:

“The whole of human organisation has its shape in a kind of rhythm... there are many other rhythms which we must be attuned to: the larger rhythms of night and day, of sleep and waking hours, of hunger and its gratification, and finally the big four - work and play and rest and sleep, which our organism must be able to balance even under difficulty.”

Recent OT literature categorises sleep (in combination with rest) as an occupational performance domain along with work, leisure, social participation, basic and instrumental activities of daily living, education, and play (AOTA, 2014). The ability to balance one's time between these eight occupational performance domains results in adequate daytime functioning and well-being. The links between sleep and performance in the other occupational performance domains has been established (Buysse, Yu & Moul, 2010; Green, 2008; Gutman & Gregory, 2017; Rogers, Trevisan & Traxler, 2017).

The American Occupational Therapy Association's *Occupational Therapy Practice Framework: Domain and Process* (2014:S22) describes sleep and rest as "Activities related to obtaining restorative rest and sleep to support healthy, active engagement in other occupations". The AOTA (2014) categorises sleep and rest into three areas, namely:

- rest;
- sleep preparation; and
- sleep participation.

Rest is described as engagement in effortless and quiet actions which interrupt physical and cognitive activity without reduced consciousness, resulting in a calm state (AOTA, 2014). It includes the identification of the need to rest, reducing taxing physical, mental, and/or social activities, and engaging in endeavours that restore energy. Rest is helpful for recovery following physical and mental effort and can be either active or passive (Helvig, Wade & Hunter-Eades, 2016). Relaxation techniques like mindfulness are active forms of rest since we have to practice them. Moderate exercise is sometimes considered active rest, as it can be more restorative than reclining or doing nothing at all (Michishita, et al. 2017). Passive forms of rest like napping or lying down also come to mind when we think of rest.

Participation in restful activities is important for health and well-being. In early childhood, rest is identified as a critical determinant of health and development. During this stage of development, participation in restful activities has been identified to result in improved learning, memory, mood regulation and revitalisation of the body (Kurdziel, Duclos & Spencer, 2013). If a sleep disorder is present, the ability to engage in rest will be

affected, thus negatively affecting learning, memory, and mood regulation of the child (Kurdziel, Duclos, & Spencer, 2013).

Unlike rest, sleep is categorized by preparing for and participating in a state of reduced consciousness (AOTA, 2014). Sleep preparation, as characterised by OT literature, involves the habits and routines needed to prepare for participation in sleep. These sleep patterns are culturally and personally defined (AOTA, 2014). They usually include the following:

- preparation of oneself for a comfortable sleep environment by engaging in certain preparatory activities such as grooming and undressing;
- spiritual activities;
- social partings;
- establishing sleep patterns; and
- determination regarding the desired time of sleep to support growth and health.

Sleep preparation also includes the preparation of the physical environment through preparatory environmental modification. A critical aspect of sleep preparation is sleep hygiene which is described as patterns and behaviours that are carried out to promote good sleep habits. A thorough sleep hygiene is important for achieving adequate sleep in childhood (AOTA, 2020). Sleep hygiene includes a set of environmental modifications and behaviours that parents need to perform to promote sleep (AOTA, 2014). These social and environmental practices include the following:

- sustaining regular sleep-wake schedules;
- reducing day naps;
- making the bed;
- securing the home;
- avoiding TV/computer use and the use of bright lights before bed;
- avoiding caffeine and food intake in the evening;
- ensuring the bedroom environment is conducive to sleep (dark, quiet, comfortable, no extreme temperatures); and
- avoiding boisterous play directly before sleep (Bruni & Novelli, 2010; Gutman & Gregory, 2017; Ho & Siu, 2018; Waters, Suresh & Nixon, 2013).



Social and environmental factors include an increase or decrease in temperature, irregular routines, and an increase in pain, noise and/or medication side effects which can have a substantial impact on the development of the circadian rhythm (Buysse, Yu & Moul, 2010).

Sleep participation is related to actions which assist with continuous sleep. This includes the cessation of all other activities to ensure sleep onset; sleeping and dreaming; performing night-time care of toilet visits, and hydration to sustain a sleep state without disruption; and negotiation of needs and interaction with others in the social environment (AOTA, 2014). Sleep participation is particularly important for children in terms of cerebral protein production. Cerebral protein production is heightened during sleep and peaks during the first three years of life (El-Shakankiry, 2011; Guyer, Huber & Fontijn, 2015; Mistlberger & Rusak, 2005; Najjar & Zeitzer, 2017; Tononi & Cirelli, 2006). Cerebral protein production regulates the two neurobiological sleep processes and assists in synaptic connection formation, otherwise known as neuroplasticity. It is widely accepted that synaptic connection formation results in memory formation, allowing the brain to retain learnt skills, or retrieve information stored in the brain which maximises cognitive functioning. It is further agreed that cognitive functioning influences communication, socio-emotional, physical, and social development (Guyer, Huber & Fontijn, 2015; Tononi & Cirelli, 2006). Tucker and Fishbein (2009) link adequate sleep to enhanced memory consolidation and motor skills acquisition. In addition, Siengsukon and Boyd (2009) found that sleep enhances motor performance.

Often “sleep” and “rest” are used to describe the same activity, but as described above, they play different roles and have different purposes for our health. The negative effects of insufficient sleep have been widely researched and researchers agree that without sleep, our bodies and brains cannot recover and recharge as effectively. Brain health, nerve cell communication, memory formation, immune responses, weight and heart health, and emotional health are all dependent on receiving adequate sleep (Goldstein & Walker, 2014; Irwin, 2019). Rest is different; while sleep assists in neuroplasticity and other internal bodily processes, rest is aimed at increasing physical and mental well-being through both active and passive activities. Rest is utilised to restore a sense of calm in typical and atypical times of exhaustion, illness, or overexertion and can result in increased quality of sleep (Robles & Carroll, 2011). While the benefits of rest are

numerous, a number of complex, restorative processes, such as neuroplasticity, are unique to sleeping and cannot be achieved through napping or other resting behaviour.

Much evidence from the literature points to the first 3 to 5 years of life being a pinnacle for neuroplasticity, as such, a decrease in sleep during the first 3 to 5 years of life is likely to result in decreased cerebral protein production and connection formation between the two cerebral hemispheres, leading to poor cognitive and motor memory (Bruni & Novelli, 2010; Jan, Reiter, & Wasdell, 2009; Siengsukon & Boyd, 2009; Tononi & Cirelli, 2006; Tucker & Fishbein, 2009; Walker, 2009)

The above insights into sleep physiology and the fundamentals of sleep as an occupation has led to a better understanding of sleep, and its link to daytime occupational performance; however, further holistic intervention strategies are needed. Currently, occupational therapists view sleep as part of the eight occupational performance domains and link the ability to balance the time between these domains to adequate daytime functioning and well-being for the child (AOTA, 2014). Occupational therapists should recognise, therefore, that disorders of sleep could result in maladaptive behaviours in the child and lead to life-long conditions (Brown, Swedlove & Berry, 2012; Luginbuehl & Kohler, 2009; Waters, Suresh & Nixon, 2013). As such, occupational therapists are at an advantage to provide intervention for rest, sleep preparation and sleep participation (AOTA 2014, 2020; Green, 2008).

## **2.3 Sleep Disorders in Children**

Sleep disorders are common amongst children worldwide (Tucker & Fishbein, 2009; Chawla & Heussler, 2016; Waters, Suresh & Nixon 2013). A study by Bruni and Novelli (2010) has highlighted the prevalence of sleep disorders across different age bands in the United States of America. Their study reveals that 86% of children between the ages of 0 to 6 suffer from a sleep disorder; whilst 81% of children aged 6 to 11, and 77% of children aged 11 to 16 also suffer from sleep disorders. That said, a paucity of literature regarding sleep disorders in children still exists world-wide; and statistics regarding the prevalence of sleep disorders in children in developing countries like South Africa (SA) continues to be scarce.

*The International Classification of Sleep Disorders: Diagnostic and Coding Manual* classifies sleep disorders into two main categories; namely, dyssomnias and

parasomnias (Westchester, 2005). In a study of the dyssomnia type sleep problems carried out in Australia (Biggs, 2010), night awakenings were found to be prevalent with over half (59.4%) of the sample waking at least once per week. Snoring and/or sleep onset problems were also reported in one in three children. Resistance at bedtime was also seen in one quarter (25.5%) of children. These factors arise because of a dysfunctional circadian rhythm. For some researchers (Davis, Parker & Montgomery, 2004; Hirshkowitz, Whiton Albert, 2015; Waters, Suresh & Nixon, 2013) common types of dyssomnias include:

- delayed-sleep phase syndrome;
- non-24-hour sleep-wake disorder;
- irregular sleep-wake patterns; and
- time-zone change syndrome.

They result in difficulty initiating or maintaining sleep, subsequently, causing excessive daytime sleepiness in those suffering from dyssomnias (Westchester, 2005).

Parasomnias were also common in children between the ages of 3 and 12 years. According to Carter, Hathaway and Lettieri (2014) 50% of children in developed countries like North America are likely to present with parasomnias. These disorders are associated with abnormal behaviour during sleep. They are disorders in which physiology or behaviours inhibit continuous sleep, thus resulting in partial arousal, arousal, or poor transitioning within sleep (Davis, Parker & Montgomery, 2004; Carter, Hathaway & Lettieri, 2014; Westchester, 2005). Types of parasomnias include somnambulism (sleep walking); somniloquy (sleep talking); sleep terrors; nocturnal enuresis; and bruxism (teeth grinding) (Waters, Suresh & Nixon, 2013; Westchester, 2005; El-Shakankiry, 2011). In the study by Biggs (2010), over half (55.5%) of the children spoke in their sleep, one third (35.8%) experienced nightmares, and one quarter (24.8%) ground their teeth at least once per week.

It is therefore imperative that occupational therapists offering sleep interventions to children recognise the distinction between the two categories as this informs the choice of interventions used to manage these disorders. Whilst intervention techniques may be similar, the focus of intervention differs. For dyssomnias, interventions focus on improvements in falling and/or staying asleep, whilst interventions for parasomnias are directed towards extinction of abnormal activities during sleep.

## **2.4 Implications of Sleep Disorders on the Child and Social Environment**

Occupational therapists are required to understand the impact of sleep disorders on childhood development as motor, social, physical, emotional, and cognitive skills develop throughout childhood (Mohan, 2017). Any diagnoses of a sleep disorder for a child, has disruptive effects for development that are often dire and long-lasting with most children exhibiting maladaptive behavioural patterns and learning difficulties. This has serious implications on both the child and their families (Meltzer & Montgomery-Downs, 2011; Moturi & Avis, 2010; Polimeni, Richdale & Francis, 2007).

Sleep disorders are frequently identified in children who show excessive opposition to structured sleep times. This is characterised by non-compliance with parental requests to move to and/or stay in bed (Carter, Hathaway & Lettieri, 2014; Westchester, 2005). Additionally, delays in sleep-onset and/or early-morning waking and night-awakening with an inability to return to sleep are also observed in the child with a sleep disorder (Carter, Hathaway & Lettieri, 2014; Westchester, 2005). Parents also complain about co-sleeping, where the child sleeps alongside the parent, family member or caregiver.

Sleep disturbances amongst children are often associated with serious functional implications. Mood and behavioural disturbances such as poor impulse control, hyperactivity, and inattention have been highlighted as the greatest areas of deficits amongst children with sleep disorders (El-Shakankiry, 2011; Moturi & Avis, 2010). Subsequently, these children have significant learning and social difficulties which impede their ability to achieve milestones expected when compared to their peers (El-Sheikh & Buckhalt, 2015; Fallon, 2015; Luginbuehl & Kohler, 2009; Polimeni, Richdale & Francis, 2007; Waters, Suresh & Nixon, 2013; Wiggs & Stores, 2004).

Inadequate sleep amongst children may result in the following outcomes:

- substantial health deficits, including increased accidental injuries and chronic diseases;
- a range of sensory processing and neurological deficits including decreased mental and emotional health (Green, 2008; Robles & Carroll, 2011); and
- harmful consequences to the musculoskeletal, immune, cardiovascular, and metabolic systems, including endocrine function and glucose metabolism (Chawla

& Heussler, 2016; El-Shakankiry, 2011; Gutman & Gregory, 2017; Wallis, Sutton & Bassett, 2018; Waters, Suresh & Nixon, 2013).

To expand, disruptions in the circadian rhythm may have a dire impact on the child. For example, a poor circadian rhythm can lead to childhood obesity as endocrine hormone secretion becomes erratic and non-functional. A non-functional circadian rhythm results in a decrease in leptin, (the satiety hormone) and an increase in ghrelin (the hunger hormone) (Buysse, Yu & Moul, 2010; Sivertsen, Harvey & Pallesen 2015). This therefore leads to childhood obesity. Stunted growth has also been attributed to disruptions in the development of circadian rhythm. This has been linked to decreased somatotropin (human growth hormone), which is specifically released during sleep (Bayon, Leger & Gomez-Merino, 2014). Consequently, the increase or decrease in sleep affects the release of somatotropin, thus affecting the growth of the child.

Given the long-term implications of sleep disorders amongst children, the lack of detection and management often results in progression of these disorders into adolescence and adulthood. This, therefore, results in maladaptive behaviours such as substance abuse and aggression; and psychiatric disorders such as bipolar mood disorder and schizophrenia (Brown, et al., 2012; Luginbuehl & Kohler, 2009; Waters, Suresh & Nixon, 2013).

Sleep disorders occur both typically and atypically in developing children (Brown, Swedlove, & Berry, 2012). The typically developing children are estimated to range from 9% to 50% (Krakowiak, Goodlin-Jones & Hertz-Piccioto, 2008). Comparably, 40 to 70% of children with neurodevelopmental disorders such as autistic spectrum disorder, sensory processing disorder, inattention and hyperactivity, prematurity and prenatal substance exposure and intellectual disability; suffer from sleep disorders. This increases the burden of care amongst their families or caregivers (Brown, Swedlove & Berry, 2012; Chawla & Heussler, 2016; Waters, Suresh, & Nixon, 2013). Commonly, children diagnosed with these conditions are among the paediatric population group most often seen by occupational therapists (Case-Smith & Arbesman, 2008; SAISI, South African institute of Sensory Integration, 2020; Zakorchemny & Lashno, 2019).

### **2.4.1 Autistic spectrum disorder**

Amongst children with autistic spectrum disorders (ASD) studies on sleep have highlighted disruptions in sleep phases. Parental reports in the USA indicate that between 44% and 86% of children with ASD experience sleep disorders (Liu, Habard, & Fabes, 2006). Decreased REM sleep, significant increases in REM density (i.e., frequency of eye movements) and increased NREM stage 1 sleep are highly frequent amongst these children (Wiggs & Stores, 2004).

Occupational therapists assist children with ASD by providing interventions which improve independence in the occupational performance areas of play, social participation, feeding, toilet training and improvement in sleep-wake cycles (Case-Smith & Arbesman, 2008; Wallace, Sutton & Bassett, 2016). Regrettably, though, previous research on outcomes in OT interventions for children with ASD have focused on the changes in client factors and performance skills related to sensory processing and development, but not on the improvements made in the different occupations (Wallace, Sutton & Bassett, 2016). This makes it difficult for occupational therapists to be recognized as role-players who can provide interventions for the occupational performance domain of sleep.

Although studies in developed countries like the USA have highlighted OT as one of the mostly frequently used services in the treatment and management of children with autistic spectrum disorder. It is unclear how frequent occupational therapists are a part of the management team for children with ASD. While current accurate national statistics on ASD in SA are limited, there are an estimated 135 000 children with ASD who are not getting specialised interventions such as occupational therapy in South Africa (Bateman, 2013). As a result, occupational therapy sleep interventions for sleep disorders in these children may not be provided. These low levels of diagnosed ASD are possibly due to the continued cultural stigma associated with having a child with ASD and possibly also the lack of health professionals to diagnose and/or care for children with ASD (Bateman, 2013).

### **2.4.2 Sensory processing disorder**

It has been estimated that up to 16,5% of school-age children present with sensory processing disorders (SPD) and 13% of children aged 3 to 9 are believed to have SPD.

In SA, the total number of children presenting with SPD is hard to come by as there is no 'gold standard' for measuring SPD (Cook, 2011; Eeles, Spittle & Anderson, 2013). Significantly, however, sleep disorders have been associated with SPD because participation in sleep is easily influenced by over- and under-responsive sensory processing (Jan, Reiter & Wasdell, 2009; Mistlberger & Rusak, 2005). Sensory processing is a neurological process where the nervous system takes sensory information from the body and environment, organises it in the brain and determines the correct behavioural response to be taken (Mistlberger & Rusak, 2005). Ayres and Robbins (2005:96) state, "the effectiveness of a child's response to sensory input is dependent upon the accuracy of the sensory feedback during the response". The sensory information includes visual, auditory, tactile, vestibular, and proprioceptive stimuli, and a child must filter between the information, focusing on important stimuli and disregarding unimportant stimuli (Ayres & Robbins, 2005). For example, to fall asleep, a child under blankets should not focus on the tactile input of a loose thread and/or the night-time sounds.

Reynolds and Lane (2011) investigated the relationship between sleep quality and the response to sensory stimuli. Their results reveal that sensory-avoidance behaviours are correlated with sleep disorders in children with ASD. Similarly, Jorge de Witt and Franzsen (2013) have identified that sensitivity to touch in typically developing children linked to the development of a sleep disorder. While Shani-Adir, et al. (2009) reported a link between decreased sleep quality and hypersensitivity in children with atopic dermatitis.

A study by Davies, Chang and Gavin (2009) has investigated the implications of appropriate and inappropriate sensory registration. Appropriate registration allows a child to detect and decode sensory input in a meaningful way. For example, settling into a calm and alert state for sleep. Davies, Chang and Gavin, (2009) found, however, that children with SPD displayed decreased organisation of auditory registration; further suggesting that children would not be able to organise more complex sensory input to initiate and continue sleep (Davies, Chang & Gavin, 2009).

Additional studies by Vasak, et al. (2015) have identified a strong link between sensory sensitivity and sleep disorders in typical and atypical infants and toddlers. Children with sensory processing disorders would over- or under-respond to sensory input due to their disorganised registration. A child who seeks out sensory input, may detest naps and

struggle to settle in for the night. Likewise, a child who is sensitive towards sensory input may struggle to fall asleep because of annoyance regarding the sound of crickets outside and/or the sensation of the sheets on their skin. These children require an increased number of minutes to initiate asleep and struggle to stay asleep (Vasak, et al., 2015).

In SA, occupational therapists have a primary role in the treatment and management of sensory processing difficulties. The South African Institute for Sensory Integration (SAISI) aims to train occupational therapists to provide a leading role in the application of sensory integration theory and practice in SA and the rest of the world (SAISI, 2020). Occupational therapists are, therefore, uniquely equipped to assist children with sensory processing disorders who may concurrently present with sleep disorders; but a gap in the management of these disorders exists.

#### **2.4.3 Attention deficit and hyperactivity disorder**

Children with sleep-related breathing disorders such as obstructive sleep apnoea display inattention and hyperactivity (Coghill & Seth, 2015). Children with restless leg syndrome may also display signs of hyperactivity and treatment of both this and sleep apnoea can lead to improvements in daytime behaviour and as such the discontinuation of stimulant medication (Coghill & Seth, 2015).

Like other childhood conditions, a multidisciplinary approach is required in the treatment and management of ADHD. The South African Depression and Anxiety group (SADAG) identifies occupational therapists as key role players in providing integrated care for those with ADHD (Weintraub, 2013). Occupational therapists provide sleep training strategies to reduce night-time activity and waking for children with ADHD (Coghill & Seth, 2015; Weintraub, 2013;).

#### **2.4.4 Foetal alcohol syndrome**

In 2012, SA had the highest rates of foetal alcohol spectrum disorders (FASD) in the world (Adebisi, Mukumbang & Beytell, 2019). Rates of over 70/1 000 were noted in the Western Cape, one of the worst affected areas globally (Adebisi, Mukumbang & Beytell, 2019). FASD occur because of prenatal substance exposure (PSE) and significantly affects the development of the brain and central nervous system (Buysse, Yu & Moul, 2010). Infants with FASD display unpredictable sleep patterns, difficulty soothing to



sleep and difficulties with resettling when awakened. In toddlerhood, fragmented sleep patterns can be seen, with decreased sleep duration and increased NREM stage 3 and 4 sleep. At the preschool-age, children present with poor sleep patterns, sleep anxiety, increased bedtime resistance, night awakenings, reduced sleep duration, and difficulties with re-settling. While school-aged children display an ongoing need for daytime napping (Buysse, Yu, & Moul, 2010; Olson, et al., 2007;).

Occupational therapists possess critical skills to address the deficits in children affected by FASD. They use background information forms and daily logs encompassing the occupational performance domains, including sleep, and offer interventions aimed at addressing the sleep disturbances amongst these children (AOTA, 2020; Zakorchemny & Lashno, 2019). Fung, Wiseman-Hakes and Stergiou-Kita (2013) have discussed the use of sleep questionnaires and logs to assess sleep patterns and concerns in children with foetal alcohol spectrum disorders. They found these tools to be a valuable assessment in providing holistic treatment to the child and the family unit.

#### **2.4.5 Emotional disorders**

Acute and chronic sleep disorders have been associated with emotional concerns and future mental health disorders. This association is often triggered by physical and mental trauma.

Research suggests that the earlier one is exposed to trauma the more likely one is to develop a sleep disorder, increasing the likelihood from 3% to 77% (Bader, et al., 2007; Chapman, et al., 2011; Brindle, et al., 2018; Sullivan, et al., 2019; Giannakopoulos & Kolaitis., 2021).

Childhood trauma has been observed to negatively affect cortisol regulation, to the detriment of sleep (Giannakopoulos & Kolaitis., 2021). It has further been associated with upregulated indicators of sympathetic nervous system activity, such as urinary catecholamines in individuals who experience trauma in childhood (Giannakopoulos & Kolaitis., 2021).

Several retrospective cohort studies report associations between childhood trauma and poor sleep quality later in life. In the Finnish Health and Social Support study, an association was found between family-related childhood trauma and self-reported poor sleep quality; showing that traumatic events significantly increased the likelihood of poor sleep quality later in life (Chapman, et al., 2011). Similarly, in a California-based health

maintenance organization study, any number of traumatic childhood experiences was shown to significantly increase the odds of self-reported sleep difficulties (Brindle, et al., 2018). A variety of other studies have likewise corroborated the hypothesis that childhood trauma is associated with poor sleep later in life. These findings display the potentially increased impact that childhood trauma has on sleep later in life (Sullivan, et al., 2019; Giannakopoulos & Kolaitis., 2021).

The decrease in sleep health has been linked to decreased emotional and mental wellness and visa versa. For example, both depression and post-traumatic stress disorder are associated with poor sleep (Bader, et al., 2007; Chapman, et al., 2011; Brindle, et al., 2018). Similarly, a traumatic childhood environment may interfere with the learning of habits related to coping with stress and possibly lead to more stress in the future (Bader, et al., 2007; Chapman, et al., 2011; Brindle, et al., 2018).

Behaviourally, environments where trauma is present promote the uptake of behaviours that may impair sleep such as smoking or alcohol use (Giannakopoulos & Kolaitis., 2021). Consequently, sleep disorders are likely to result in negative mental health outcomes such as anxiety and mood disorders (Bader, et al., 2007; Chapman, et al., 2011; Brindle, et al., 2018).

#### **2.4.6 The effect of sleep disorders on the child and family unit**

Childhood sleep disorders have a serious implication on the health and well-being of the parents and/or caregivers. Increased anxiety, stress and depression has been reported amongst parent/s and caregivers of children with sleep disorders (Leland, Fogelberg, & Sleight, 2016; Meltzer & Montgomery-Downs, 2011; Moturi & Avis, 2010; Polimeni, Richdale & Francis, 2007; Wiggs & Stores, 2004). When a child's sleep pattern is disrupted, it has a direct implication on the sleep patterns of the parent/carer. In cases where a child struggles to sleep throughout the night the parents/carers are also required to stay up. This creates maladaptive sleep routines which is associated with mood dysfunctions. The mood disturbances, like depression amongst parents/carers, have an impact on the quality of care received by the child, which consequently worsens the child's condition (Meltzer & Montgomery-Downs, 2011).

Insufficient sleep in children can be associated with poor maternal daytime functioning due to fragmented sleep (Mindell & Owens, 2015). Subsequently, increased stress, parental feelings of helplessness, conflict, marital discord, and health difficulties can

occur due to decreased sleep. Hoffman (2008) suggested that sleep disorders in children with ASD placed greater stress on their mothers. This is attributable to the fact that these mothers are expected to deal with the sleep disorder in addition to the stress of parenting a child with disabilities and managing the household duties.

Leland Fogelberg, and Sleight. (2016) allude to the fact that caring for a child with a sleep disorder causes increased stress and irritability in the entire family unit (Hoffman, et al., 2008; Wiggs & Stores, 2004). Relationships in the family unit may also become strained due to conflict and bullying between siblings which may occur due to unequal treatment of the children (Krakowiak, Goodline-Jones, & Hertz Piccioto., 2008; Meltzer & Montgomery-Downs, 2011; Mindell & Owens, 2015; Wiggs & Stores, 2004).

It is, therefore, important that interventions aimed at a child with a sleep disorder are also focused on the parent/carers and the entire family unit. Early detection of sleep disorders and their functional implications on the child and their family forms a basis through which appropriate intervention strategies can be identified. Occupational therapists, therefore, have a unique role in providing interventions targeted towards the establishment of roles, habits, and routines of the child. The intervention plan is formulated based on an understanding of the child's cognitive, emotional, social, and physical capacity.

## **2.5 Occupational Therapy Interventions for Sleep Disorders**

Occupational therapists are required to offer interventions targeted at addressing dysfunctions in the areas of occupational performance including rest and sleep. While enhancing occupational performance is at the core of the OT profession, evidence to demonstrate the contribution of occupational therapists in the management of rest and sleep remains limited. One study which considered the occupational therapists' role in the management of sleep for children was undertaken by Brown, Swedlove and Berry (2012). A self-administered cross-sectional survey '*The Occupational Therapy Health Literacy Skills for Pain and/or Sleep Disorder Survey*' was used to understand the practices for promoting health literacy of children with disordered sleep and/or pain and their parents/caregivers, and to identify challenges to providing these interventions. In this study, occupational therapists reported 21.5 % of their patients to have disordered sleep, however few interventions and many organizational, knowledge-based and

resource challenges were identified (Brown, Swedlove & Berry, 2012). Unfortunately, no such study could be found in South Africa.

Even so, the functional implications of sleep disorders in children are clearly highlighted in the literature. Occupational therapists use evidence-based interventions to address the functional implications brought about by sleep disorders. The international literature suggests that occupational therapists may manage sleep disorders through interventions aimed at prevention, promotion, and rehabilitation amongst those afflicted (AOTA, 2014; Christiansen & Baum, 2005; Green, 2008).

Occupational therapists can provide a holistic approach by exploring the impact the child's sleep pattern has on the family unit. Different therapeutic approaches, embedded within the scope of OT, may be used to address a variety of specific needs which may include sleep disorders (AOTA, 2014; Christiansen & Baum, 2005). However, despite being recognised as a need in 1924, by Chapman, a contemporary of Adolf Meyer (Bruni & Novelli, 2010) a paucity of literature in OT sleep intervention still exists (Leland, Fogelberg & Sleight, 2016). The literature reviewed for this study considered intervention for sleep disorders in children, in both typical and atypically developing children, and found that occupational therapy could intervene for sleeplessness (Bruni & Novelli, 2010).

### **2.5.1 Assessing sleep disorders from an occupational therapy perspective**

Occupational therapists can assess for sleep disorders and their effects on occupational performance and activity participation through parent- and child-based questionnaires. These questionnaires explore the following:

- the quality and quantity of sleep;
- the child and parent's feelings around sleep;
- the amount of energy; and
- the need for sleep in the daytime hours.

Occupational therapists then investigate the presence of other DD, behavioural disturbances, and environmental factors which could facilitate and/or hinder sleep. They must consider the impact sleep and sleep dysfunctions have on daytime functioning and other occupational performances of both the child and parents (Brown, Swedlove & Berry, 2012; Fung, Wiseman-Hakes & Stergiou-Kita, 2013).

Standardised questionnaires are valuable in the evaluation of potential sleep disorders in children. The BEARS Paediatric Sleep Screening Tool (B=Bedtime Issues, E=Excessive Daytime Sleepiness, A=Night Awakenings, R=Regularity and Duration of Sleep, S=Snoring) evaluates potential sleep problems in children aged 2 to 18 years (Spruyt & Gozal, 2011). The tool is well-established and used internationally by various health-care practitioners; including occupational therapists (Owens, Spirito & McGuinn, 2000; Spruyt & Gozal, 2011). This tool has been designed with a Well Child Check (WCC) and is significantly more sensitive to the identification of sleep problems in this population (Owens, Spirito & McGuinn, 2000). In the international study, the validity of the tool indicated a test-retest reliability significant at  $p < 0.05$  (Mohammadi, Amintehran & Farhard, 2008).

The Brief Infant Sleep Questionnaire (BISQ) was specifically designed for the infant population group (Sadeh, Gruber & Raviv, 2004; Zakorchemny & Lashno, 2019). This is a parent-reported questionnaire for infants and toddlers up to the age of 29 months. There are two test items in the BISQ:

- the BISQ, looking at sleep duration, night waking and method of falling asleep; and
- the BISQ extended, which adds bedtime rituals, sleeping arrangements, parental interventions, and demographic information.

The BISQ and its scaling was validated according to actigraphy, which correlated with sleep logs and with caregiver reports, and is further free to use (Sadeh, Gruber & Raviv, 2004).

Grading et al., (2011) examined the Children's Sleep Habits Questionnaire (CSHQ). The CSHQ was developed by Owens, Spirito & McGuinn (2000), and reflects key sleep domains that include major medical and behavioural sleep disorders in children, aged 2 to 10 (Goodlin-Jones, Sitnick & Tang, 2008; Owens, Spirito & McGuinn, 2000). The CSHQ is a parent-reported screening survey which consists of eight categories:

- bedtime resistance;
- sleep onset delay;
- sleep duration;
- sleep anxiety;
- night awaking;

- parasomnias;
- sleep disordered breathing; and
- daytime sleepiness.

This tool is available for use as a screening tool by healthcare practitioners, including occupational therapists, and has been found to be accurate in identifying both behaviourally-based and medically-based sleep disorders in school-aged children (Goodlin-Jones, Sitnick, & Tang, 2008; Owens, Spirito & McGuinn, 2000). According to Hoffman, et al., (2008), the CSHQ is the most used, standardised sleep measure for children with ASD. Moreover, Souders, Mason and Valledares (2009) found the CSHQ total score corresponded with actigraphy results and can identify sleep disorder in typically developing children and those with ASD, obstructive sleep apnoea, ADHD, and other DD.

Various aspects are taken into consideration when choosing an assessment method. These include the cost, the type of evidence needed, the unique features of the child, and the overall suitability of the assessment for both the parents and the child. The knowledge and awareness of the occupational therapists regarding the assessment methods are also considered.

Although these assessment measures exist, the literature's limited discussions involve the occupational therapist's assessment ability regarding sleep in children on a national level. Occupational therapists in SA may use the *Occupational Therapy Practice Manual: Domain and Process* (AOTA, 2014) which provides some guidelines on what occupational therapists may assess and treat in terms of sleep.

### **2.5.2 Treatment of sleep disorders in occupational therapy**

In developed countries such as the United Kingdom and United States, interventions for sleep disorders in children are offered at specialised sleep clinics. These interventions are provided by specialist doctors, psychologists, nurses, and sleep practitioners. The focus is often placed on the identification and provision of services for medical concerns associated with the sleep disorder with less focus on addressing the functional deficits (Buysse, Yu & Moul, 2010). Often medications like melatonin and clonidine are administered, temporarily concealing the sleep dysfunction, without correcting the underlying cause (Bernard & Turk, 2009; Malow, MacDonald & Fawkes, 2016).

Melatonin is often used for the treatment of dyssomnias; whilst clonidine is used for parasomnias (Bernard & Turk, 2009; Bruni & Novelli, 2010; Malow, Adkins & Reynolds, 2014).

Occupational therapists form part of any multidisciplinary team that offers interventions for parental support and the structuring of bedtime and sleep routines for the affected child. The literature indicates that these interventions include environmental and social modifications, typically based on a cognitive-behavioural approach such as Cognitive Behavioural Therapy for Insomnia (CBTi) (Eakman, Schmidt & Henry, 2017; Wooster, & Gwin, 2015) and lifestyle redesign (Leland, Fogelberg, & Sleight, 2016). Self-regulation and sensory processing interventions based on sensory integration approaches, and parent/ carer education are also suggested (Spira, 2014). These interventions are individualised to the specific child and their family as part of a larger treatment programme.

Ho and Siu (2018) have proposed a conceptual framework for organising sleep interventions within the OT practice. Their framework has two main components based on the Person-Environment-Occupation-Performance (PEOP) model: the 'Person' which relates to bodily function, including physiological, psychological, and cognition performance, and the 'Environment', including the physical, social, or cultural domains. The control of environmental factors plays a significant part in sleep quality (Gee, et al., 2017; Jarus, Bart & Rabinovich, 2011; Wooster, & Gwin, 2015;). The 'occupation', that refers to the occupational performance domain of sleep, and the 'Performance' which focuses on the level of efficiency and results of engaging in sleep are also important but not focused on. Ho and Siu (2018) focus on improving the person's skills or modifying the environment to assist in sleep performance. But when people perform occupations, they do so within a context or environment (Ho & Siu, 2018). The interaction between the person and the environment positively or negatively influences the ability to prepare and participate in sleep. When the person and environment match in supporting the valued occupation, success in the performance of the occupation eventually leads to participation and well-being (Ho & Siu, 2018).

### **2.5.2 1 Sleep interventions related to the person**

Sleep interventions targeting bodily function use several approaches. Two approaches can be used by occupational therapists: cognitive behavioural therapy (CBT) and sensory integration (SI) (Ayres & Robbins, 1996; Slepecky, Huri, & Sahin., 2017).

CBT can be applied to address the functional implications of sleep disorders in the affected children and their parents/carers (Bruni & Novelli, 2010; Rogers, Trevisan & Traxler, 2017). Useful interventions, in this approach, include conditioning therapy like:

- standard extinction and graduated extinction;
- bedtime routines;
- social stories;
- scheduled awakenings; and
- parent training programmes.

All the above have shown promising results for sleep disorders in typically developing children (Bruni & Novelli, 2010; Rogers, Trevisan & Traxler, 2017; Slepecky, Huri, & Sahin, 2017). Extinction is a type of behavioural therapy where unintentional reinforcement for a problem behaviour is discontinued to decrease or eliminate occurrences of these problem behaviours (Bruni & Novelli, 2010; Slepecky, Huri, & Sahin, 2017). This type of therapy from various studies have shown promising results for typically developing children (Meltzer & Mindell, 2014), those with DD such as ASD (Richdale & Wiggs, 2005; Vriend, et al., 2011).

A study by Johnson, Turner and Foldes (2013) has focused on improving sleep for children with ASD through behavioural parent training. The results demonstrate that behavioural parent training is effective in the treatment and management of sleep disturbances amongst these children. Behavioural parent training was also found to be efficient as it can be delivered through direct professional-to-parent training (Meltzer & Mindell, 2014) and tele-communicative consultations (Corkum, Lingley-Pottie & Davidson, 2016).

Williams, Sears and Allard (2006), Vriend, et al. (2011), and Hiscock, et al.(2015) found that behavioural interventions result in positive outcomes for the child and their family regardless of the strategy used, so long as the parents were fully involved in implementation. Similarly, Rogers Trevisan and Traxler (2017) reported that behavioural



interventions resulted in improved sleep performance consistently for typically and atypically developing children with conditions such as developmental delay, ASD, sensory modulation disorders (SMD), ADHD, oppositional defiant disorder (ODD), and visual impairments.

Additionally, Garrison & Christakis (2012) proposed a unique behavioural approach, which focused on nullifying the viewing of violent media for preschool children. The results of the study concluded that sleep behaviours improved due to the reduction; however, these improvements did not last long as established in their 18-months of follow-up (Garrison & Christakis, 2012). The limited evidence suggests that although positive results are seen, this approach may be insufficient in improving sleep in typically developing children and those with developmental delay (Richdale & Wiggs, 2005) or ASD (Vriend, et al., 2011). Even so, behavioural interventions are found to consistently result in improved sleep performance. These findings are significant in as much as they provide evidence that the use of pharmaceutical interventions may not always be necessary.

SI interventions have also been associated with positive outcomes for sleep (Bruni & Novelli, 2010; Davis, Parker & Montgomery, 2004; Mindell & Owens, 2015; Rogers, Trevisan & Traxler, 2017). Occupational therapists have the skills to provide interventions based on sensory processing and sleep. Research shows that addressing sensory avoiding/seeking behaviour by increasing or decreasing the amount of sensory input can result in improved sleep performance (Iwama, Wilson, & Durant, 2015; Jorge, de Witt & Franzsen, 2013; Luginbuehl & Kohler, 2009; Moturi & Avis, 2010; Rogers, Trevisan & Traxler, 2017; Wiggs & Stores, 2004). For children aged 6 to 11 with SMD and reported sleep disorders Spira (2014) established that nightly moderate pressure massages resulted in significant sleep related outcomes.

Lifestyle management, such as the integration of SI into one's routine, can also be used in guiding the choice of daily activities for improved sleep. While everyone has the right to determine their daily occupations, damaging choices in daytime activity can have a negative impact on sleep. Thus, sleep management programmes can balance sleep and other occupations (Leland, Fogelberg & Sleight, 2016). Zakorchemny and Lashno (2019) proposed that the addition of a sensory diet to child's daily routine can improve sleep. A sensory diet assists a child to organise their response to sensory stimuli to

provide an adaptive response while participating in occupational tasks such as sleep preparation.

DeGangi, et al. (1996) suggest that a combination of sensory integration, parent training, and cognitive behavioural therapy may produce favourable results for children worldwide. Interventions for sleep disorders are based on studies of normal sleep patterns in infants and children, incorporating principles related to the ability to self soothe (a sensory-based intervention) and night-time sleep patterns (using parent training and cognitive behavioural therapy). DeGangi, et al. (1996) also found that this integrated approach resulted in improvements in behaviour and emotional regulation of infants. It was further noted that this improved sleep participation.

Unfortunately, a lack of referral to occupational therapists appears to exist in SA (Jorge, de Witt & Franzsen, 2013). As such, sensory integration interventions may not be provided to infants and children, even though their ability to fall and stay asleep is reported to be influenced by sensory modulation difficulties related to auditory, vestibular, and tactile processing. The lack of referral to occupational therapists may display a lack of awareness of sensory processing disorders in children; as well as a lack of knowledge regarding sensory integration-based interventions for sleep disorders in children.

#### ***2.5.2.2 Sleep interventions related to the environment***

Occupational therapists recognise the critical role played by environment in human function (AOTA, 2014). The child's immediate environment can trigger stress in the child therefore hindering sleep engagement (AOTA, 2020; Biggs, 2010). For children who already display a disorganised and vulnerable central nervous system, such as those with ASD, inappropriate responses to the environment could occur due to poor self-regulation (Biggs, 2010). It is, therefore, important to try to reduce environmental stimulation as far as possible to lessen the stress to the child and promote sleep engagement which is critical for a child's development (AOTA, 2020; Biggs, 2010).

Occupational therapists focus on the outcome of participation. One method in which they achieve these outcomes is through adaptations and modifications to the environment to enable engagement (AOTA, 2014). To decrease the stress that the environment could have on the child, occupational therapists modify the sleep

environment by adapting noise, lighting, temperature; providing calming activities/routines to facilitate sleep such as the application of weighted blankets, swaddling and soothing toys, and positioning; controlling light, temperature, and humidity levels (Zakorchemny & Lashno, 2019). Occupational performance in sleep has been found to benefit from support in the physical or social environment to enrich participation (AOTA, 2014).

A link between sensory stimulation and sleep was also found by Zakorchemny and Lashno, (2019). A study by Vasak, et al. (2015) has further suggested that by tackling the levels of stimulation in the daytime, by reducing and/or increasing environmental factors (for example, noise, light, temperature, sleep location and tactile aspects), sleep would improve in children with sensory needs.

Occupational therapists are, therefore, uniquely skilled to assist children in maintaining a balance of sensory and motor activity throughout the day. By doing so, the impact on sleep may result in smoother transitions to bed, increased co-operation in naps, calmer night-time routine and increased wakefulness in the morning (Zakorchemny & Lashno, 2019). There are several environmental sensory strategies recommended as part of a sensory diet. Tools that provide tactile and proprioceptive (deep-pressure) input are used for calming and relaxation purposes for children who have over-responsivity and under-responsivity sensory patterns (Zakorchemny & Lashno, 2019).

Environmental sensory strategies, although not inclusive, could be employed in the management of sleep disorders as follows:

- For proprioceptive/tactile input: vibrating toys/pillows; deep pressure rubs with(out) lotion; wrapping a child in blankets and/or placing weighted blankets on the child;
- To provide calming auditory input: singing simple rhythmic songs; playing white noise.
- For slow vestibular input: gentle linear or slow rolling back and forth movement;
- To provide visual input: adjusting for lighting by providing night lights.

Since OT focuses on both the child and their parent/carer to ensure effectiveness and sustainability of the interventions, occupational therapists educate parents and caregivers on sleep terminology and misconceptions. Parental education is a crucial part of environmental interventions. Studies by Wilson (2014) and Gruber (2016) have established strong links between parental education and improvements in sleep

duration; parent self-knowledge, self-efficacy, and attitudes; and child academic performance.

Parental education related to management of sleep disorders, environment and behaviour modifications have been identified to positively influence the entire family unit (Adkins, Mollow & Wiess, 2012; Malow, MacDonald & Fawkes, 2016; Wooster, & Gwin, 2015). Occupational therapists educate parents and children on time and anxiety management (Ponsford, Ziino & Parcell, 2012); modification of behaviours to optimize sleep (AOTA, 2020) and recommendations regarding changes to the environment to facilitate the timing of sleep and wakefulness (Ponsford, Ziino & Parcell, 2012).

To achieve adequate sleep for optimal daytime functioning for both the child and family, children are usually seen weekly for OT to develop a holistic strategy that meets the cultural, economic, environmental, physical, and social needs of the family. Information gathered during the weekly sessions are invaluable, and if shared with other team members, like the psychiatrist, paediatrician, and/or the social worker, maxim gains and improved overall function in sleep can be achieved (Zakorchemny & Lashno, 2019).

## **2.6 Training for Providing Sleep Interventions**

To provide effective sleep interventions directed towards the needs of the child and their family, occupational therapists should draw on the theoretical knowledge of sleep, causes, and implications of sleep disorders. Improving the knowledge base for professionals and caregivers is necessary in providing good quality care (Brown, Swedlove & Berry, 2012; Fung, Wiseman-Hakes & Stergiou-Kita, 2013).

With the increased awareness regarding OT intervention for sleep disorders, the appropriateness of the undergraduate and postgraduate training for occupational therapists to offer sleep interventions it is particularly important to consider. At an undergraduate level, in SA, occupational therapists are educated in the basic theory of biological sciences, medicine, mental health, and atypical versus typical childhood development (The South African Qualifications Authority, 2019). A broad overview of childhood development and general paediatric theory is also taught, forming the basis for providing intervention for children of different age groups after graduating.

Occupational therapists are taught to use a holistic approach when dealing with clients, making them particularly suited to address the sleep needs of a child and the different

links to other areas of development (The South African Qualifications Authority, 2019). Undergraduate OT students are taught to not only work with the patient, but also to understand the value of working with the family (The South African Qualifications Authority, 2019). This is of particular importance when working in the paediatric setting, as the theory can be carried over from the undergraduate OT curriculum into practice, whereby occupational therapists cooperate with parents on issues relating to their child, to ensure the child with sleep disorders receives the appropriate care (AOTA, 2020; The South African Qualifications Authority, 2019). But literature by Ho & Siu (2018) and Nurit and Michal (2003) suggest that minimal to no training regarding interventions for sleep disorders is provided to OT students on an undergraduate level.

Sleep intervention for children could therefore be considered a specialist area, requiring specialist training on a postgraduate level. This training could include sensory integration, and familiarisation with equipment and procedures related to sleep interventions at various hospitals (Bernard & Turk, 2009; Fallon, 2015). Limited occupation-based interventions and patient-centred environmental modifications for sleep that impact on the understanding of the role of OT in rest and sleep are further suggested (Rogers, Trevisan & Traxler, 2017).

Theoretical knowledge of the child and sleep disorders is essential in reaching a level of competence that ensures safety and success of OT. In SA, occupational therapists are considered qualified and able to provide interventions for all the occupational performance domains, including sleep and rest, following a 4-year bachelor's degree (World Federation of Occupational Therapists., 2016). They are required to complete one year of community service within the public sector, as required by the Health Professions Act 56 of 1974 (Van Der Reyden, 2010). As such, if minimal to no training regarding OT sleep interventions are provided on an undergraduate level, community service occupational therapists, with limited knowledge and experience, may be expected to work independently to provide interventions to children with sleep disorders (Ned, Tiwari, & Buchanan 2020). The implications include decreased quality of interventions and/or lack of intervention. A lack of or poor-quality intervention could exacerbate the sleep disorders, further debilitating the child and family unit (Brown, Swedlove & Berry, 2012; Fung, Wiseman-Hakes & Stergiou-Kita, 2013). This highlights a need for the inclusion of basic theoretical knowledge on sleep disorders and the role of OT in intervening for sleep disorders at an undergraduate level.

## 2.7 Conclusion

In OT, sleep is recognised as a restorative occupation which is vital for cognitive, emotional, physical, and communication performance in daytime occupations. However, there are a few studies by occupational therapists that look at the impact that sleep interventions have on daily functioning.

With the world-wide increase in sleep disorders amongst children, there is a need for research on the different interventions that can be provided. Research indicates that sleep interventions can improve sleep in both typical and atypical developing children. Sleep disorders may result from a variety of factors, such as:

- client factors such as sensory regulation and mood;
- performance skills such as cognitive reasoning; and
- occupational performance areas such as social skills and education.

Research has further indicated that parental involvement is vital. For that reason, occupational therapists are encouraged to consider interventions which involve and support the child's environment, including their parents.

Regrettably, occupational therapists may not be equipped currently to address the needs of children with sleep disorders in SA. Educational sessions regarding sleep and wakefulness should be integrated into the existing OT curriculum so that students develop the knowledge, skills, and competencies to address sleep disorders in children.

In addition, occupational therapists should increase their practise knowledge by engaging in continuous professional development (CPD) activities which address sleep disorders and their interventions. Increasing the knowledge and inclusion of sleep interventions from an OT perspective will allow for improved capability in practice, education, and research.

## **CHAPTER 3. METHODOLOGY**

### **3.1 Introduction**

This chapter describes the research methodology used in this study. A detailed description of the study design, measurement tools, study population, subject sample, inclusion and exclusion criteria, and procedure used for data collection is provided. The ethical considerations relating to this study are also discussed.

### **3.2 Study Design**

A quantitative, descriptive, cross-sectional study design was used to enable the researcher to gather evidence on occupational therapy (OT) sleep intervention for children with sleep disorders, and the training acquired to offer these interventions (Polgar & Thomas, 2013).

A quantitative research design is a type of research in which numerical data is collected (Polgar & Thomas, 2013). Quantitative research design was chosen for the collection and analysis of the data on the sleep interventions offered by occupational therapists working with children diagnosed with sleep disorders in SA. It includes the training received by occupational therapists to offer sleep interventions to children with sleep disorders (Punch, 2013).

Descriptive research describes characteristics of the population under analysis and comments on such characteristics (Payton, 1988). It does not involve manipulation of any aspects relating to the sample. The focus is to consider attributes of a sample of the population to make assumptions about such a population (Payton, 1988). The disadvantage of using descriptive research includes bias (Payton, 1988). Such bias is usually unintentional, as the researcher interprets the information in correlation to what he/she expected the result of the study to be (Payton, 1988).

A cross-sectional survey was chosen for ease of access to occupational therapists, in their various contexts, who provide sleep interventions to children in both the private and public sector within SA (Payton, 1988; Polgar & Thomas, 2013; Bailey, Hissong & Lape, 2015). The general purpose of a survey is to collect data that accurately describes the traits of a population. Surveys can, therefore, be used to collect demographic information from the chosen population (Polgar & Thomas, 2013).

The benefit of using a survey varies depending on whether open-ended or close-ended questions were used (Jackson, 2015). In the survey used for this research, close-ended questions were used since they are easy to analyse due to having limited options when answering the questions and, therefore, misinterpretation of the data is largely eliminated. In addition, a survey can be used to reach many respondents with minimal costs, especially when emailing the survey (Kielhofner, 2006). Moreover, the respondents' anonymity is also more likely as there is no contact between the respondents and the researchers (Kielhofner, 2006). However, a disadvantage of using close-ended questions is that it limits the respondents in their reply (Jackson, 2015). In addition, the lack of contact between the respondents and the researchers means that misinterpretations of the questionnaire cannot be clarified (Kielhofner, 2006). With a mailed survey, therefore, the response rate is generally lower than when a survey is filled in by personal contact (Kielhofner, 2006).

This study's design enabled the researcher to collect all the data at one point in time (Taylor, 2017). This assisted the collection of data for:

- descriptive analysis;
- conclusions about the awareness of sleep disorders in children;
- the OT sleep interventions for children; and
- the current training received by occupational therapists to offer the sleep interventions (Punch, 2013).

### **3.3 Population and Sample**

This study population included occupational therapists providing services to children, in all fields of practice in both public and private health sectors within SA. Occupational therapists, who had prior knowledge on sleep disorders in children, as well as those without any knowledge in treating children with sleep disorders were included in the study. A set selection criterion highlighted within the sampling for the study was used to identify suitable respondents for this study.

#### **3.3.1 Sample selection**

A non-probability, convenience sampling method was used to access respondents registered in the following organisations:



- Occupational Therapy Association of South Africa (OTASA) (2018);
- South African Institute for Sensory integration (SAISI) (2020); and
- Rural Rehab South Africa (RuReSA) (Taylor, 2017).

The OTASA is a non-profit organisation for occupational therapists and assistants/technicians who are interested in supporting the profession. The organisation provides services such as medical insurance (via the Medical Protection Society) and information regarding continuous professional development (CPD) courses, which are a requirement for the Health Practitioners Council of South Africa (HPCSA) membership (Health Practitioners Council of South Africa, 2017; South African Qualifications Authority, 2019). The South African institute of Sensory Integration (SAISI) is a non-profit organisation which provides sensory integration (SI) training of internationally accepted standards to enable occupational therapists to provide a service of excellence for the ultimate benefit of the client and their families. Rural Rehab South Africa (RuReSA), who are committed to providing and improving rehabilitation services in rural communities, is a non-profit organisation for occupational therapists and occupational assistants/technicians working in the rural areas within SA. Membership to OTASA, SAISI and RuReSA is voluntary, and a membership fee is renewed annually (Occupational Therapy Association of South Africa, 2018). Therapists registered with SAISI do so through OTASA and therefore make up the number of occupational therapists registered with OTASA. As such, SAISI members were included in the email from OTASA. This method allowed the researcher to select a sample of occupational therapists providing services to children from the population, based on their availability to complete the online survey.

To ensure a more representative sample, snowball sampling was also used to access respondents not registered with OTASA, SAISI and RuReSA. This was done by requesting existing respondents to forward the survey link with potential secondary respondents who met the inclusion criteria (Polgar & Thomas, 2013; Taylor, 2017).

### **3.3.2 Inclusion and exclusion criteria**

A set of predetermined inclusion and exclusion criteria was used as a guide for selecting respondents for this study (Bailey, Hissong & Lape, 2015). The inclusion criteria were added to reach a specific target population and ensure a homogenous sample (see Table 3.1 below):

Table 3.1 The inclusion and exclusion criteria used for respondents of this study

| Inclusion Criteria                                                                                        | Exclusion criteria                                                |
|-----------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------|
| Occupational therapists in all fields of practice in South Africa                                         | Occupational therapists who have not offered services to children |
| Occupational therapists in both the public and private health sectors                                     |                                                                   |
| Occupational therapists who were at the time of study providing services to children within their setting |                                                                   |

### 3.3.3 Sample size calculation

To identify the representative sample for the study, a total number of occupational therapists registered on Health Professions Council of South Africa (HPCSA) was used to calculate the sample size. At the time of the study in 2018, the South African Health Review (2018) estimated that the number of registered occupational therapists in SA was at 4 571. The target population for this study included occupational therapists offering services to children in both public and private health care sectors in SA. This constitutes only a small percentage of the overall number of occupational therapists identified as employed in public and private healthcare settings, but it is not known how many of these occupational therapists provide services to children in SA as there is no official register.

Information was extracted from the available literature and reports by OTASA to calculate the representative sample size for this study. OTASA reported that about 20% of occupational therapists on their data base, at the time of the study, were occupational therapists working with children.

Taking both these estimates into account, of the 4 571 registered occupational therapists within SA, 1371 were likely to offer OT services to children in both private and public healthcare sectors. Of the 1371 occupational therapists offering services to children, between 105 to 110 responses were required to allow for a representative sample size: with a margin of error set at 5% margin, with the confidence interval of 95% on Cochrane's formula (Bartlett, Kotrlik & Higgins, 2001). In total, 118 respondents were included in the sample size.

### **3.4 Measurement Instrument**

*The Occupational Therapy Health Literacy Skills for Pain and/or Sleep Disorder Survey* (Appendix A), developed by Brown, Swedlove and Berry (2012) was used in this study. This is a self-administered cross-sectional survey with a response burden of 20 to 40 minutes. It was developed and used in Canada as part of a national study aimed at determining the interventions occupational therapists provide to children with sleep disorders and pain (Brown, Swedlove & Berry, 2012).

The survey consists of 14 closed-ended and 18 open-ended questions divided in to three sections: namely, demographics, sleep, and pain management.

- For the demographics, the survey consists of closed ended sub-questions on the gender, educational qualifications, area(s) of practice and the type of case load managed by the respondents. The demographic question on the areas of practice was removed as this study focused on the paediatric interest group of occupational therapists.
- The sleep management section consists of five closed-ended questions and seven open-ended questions, specifically regarding treatment to children. The closed-ended questions are used to understand the percentage of sleep disorders seen by practitioners; the interventions offered as well as the various barriers associated with the provision of interventions for sleep disorders. The open-ended questions are used to further understand the nature of interventions offered for sleep disorders as well as strategies to support delivery of intervention.
- Like the sleep management section, the pain management section consisted of five closed-ended questions and seven open-ended questions. The former questions were used to understand the percentage of pain disorders seen by practitioners; the interventions offered; as well as the various barriers in the

intervention for pain disorders. The latter questions are used to further understand the interventions offered for pain disorders as well as strategies to support delivery of intervention. This section, however, was excluded from the study as it does not relate to its specific purpose which is focused only on the OT management of sleep disorders in children.

- Lastly, two general open-ended questions are used to gather information around resource availability and other comments related to pain and sleep disorders.

### **3.5 Validity and reliability of the measurement instrument**

The original survey was piloted for clarity, content validity and to determine the response burden through literature scoping with the assistance of a senior medical librarian, and in consultation with an advisory committee of six OT experts from the University of the Witwatersrand. Since the tool did not include any measurements of specific traits, construct validity was not a concern.

The questionnaire was deemed appropriate for this study as it enabled the researcher to gather generic data on:

- the profile of occupational therapists working with children with sleep disorders in South Africa,
- the interventions they provide; and
- the training they have received.

A pilot study conducted on the original questionnaire established that was adaptable in a variety of contexts (Eldridge, Lancaster & Campbell., 2016). An existing survey could not be found within the South African context, making the 'Occupational Therapy Health Literacy Skills for Pain and/or Sleep Disorder Survey' appropriate for use in this study. Therefore, to use and adapt the existing survey for use with the South African context, permission was obtained from the developers of the survey (Appendix B).

#### **3.5.1 Piloting of the measurement instrument**

To ensure appropriateness for use in this study, the measurement instrument was piloted prior to commencement of data collection. This took place between on the 14 and 21 February 2019. The original survey was adapted and piloted to determine the response burden, the clarity, and the feasibility for use in the South African

context (Eldridge, Lancaster & Campbell., 2016). This was necessary to minimize bias in the results. A well-designed research tool must demonstrate validity where it accurately measures the component to be measured. Although an existing, robust research tool was used, validity of the tool in the South African population needed to be proved.

Typical pilot sizes range between 5 and 12 respondents (National Council for the Social Studies, 2015). A sample size of 12 has been suggested as a rule of thumb; however, this number cannot be blindly adopted for any study (Julious, 2005). For this study, the number of respondents chosen were based on tables calculated with the program Pass 14 (National Council for the Social Studies, 2015). The upper confidence level was set to 80% and the margin of error was set at 20% to calculate the pilot sample size (Browne, 1995). Based on the calculation, six respondents were required for the pilot study.

Therefore, six OT experts in the field of paediatrics were selected to pilot for content validity. The respondents used a Likert scale to report on whether they thought each question was relevant, similar, applicable to the South African context and clear to clear up any misinterpretation. Changes were made based on the recommendations made by the OT experts.

Adaptations made to the survey based on the recommendations included removing questions irrelevant to the focus of this study. This included removal of questions in the demographic section that were not applicable to the South African context and those that were not related to the role of OT in the management of sleep disorders (See Appendix C). Questions were added to the original survey following recommendations in the piloting. The added questions were simply formulated to avoid uncertainty and misinterpretation (Bailey, Hissong & Lape, 2015).

The revised survey took about 20 to 30 minutes to complete and used 11 open-ended questions and 24 closed-ended questions divided between two sections: namely, demographics, and sleep management. In the demographic section, questions regarding the respondents age, province, sector and setting of work, number of years practising, level of qualification and place of study were added.

The adapted 'sleep management' section consisted of 14 closed-ended questions and 11 open-ended questions. Five closed-ended questions were taken directly from the

original questionnaire. These questions focus on the percentage of interventions related to:

- teaching the child new information and sleep strategies;
- the percentage of interventions related to teaching the caregiver new information and sleep strategies;
- the percentage of efficacy related to teaching the child or the parent; and
- the barriers which may hamper sleep interventions.

Five closed-ended questions were added to gather information on:

- whether training on sleep interventions was received at a graduate or postgraduate level;
- whether respondents see children;
- which age group; and
- what caseload.

Four closed-ended questions were added and used to determine:

- whether respondents provided sleep interventions at their respective institutions;
- what is their role in sleep interventions;
- what type of interventions they provide; and
- what percentage of children with sleep disorders were treated.

The 11 open-ended questions were taken directly from the original survey and used to gain insight into the participant's attitudes, feelings and understanding regarding the OT sleep interventions for children with sleep disorders (Jackson, 2015). The open-ended questions were used to further understand the interventions offered for sleep disorders as well as strategies to support delivery of intervention.

### **3.6 Research Procedure**

The following section discusses the research procedure followed to collect and analyse the data. A quantitative, descriptive, cross-sectional survey was created on REDCAP, piloted, and distributed through OTASA and RuReSA. The survey was made available to respondents for three months (March to May; 2019) and all data was analysed numerically (Bailey, Hissong & Lape, 2015; Polgar & Thomas, 2013).

### **3.6.1 Data collection procedure**

A survey questionnaire was used to collect data on the sleep interventions which occupational therapists provide to children within the public and private healthcare sector throughout SA (Bailey, Hissong & Lape, 2015).

'The Occupational Therapy Health Literacy Skills for Pain and/or Sleep Disorder Survey' by Brown, Swedlove, and Berry (2012) was identified as appropriate to collect the relevant data that will answer the research question in this study. Following this, the author was contacted for permission to pilot and adapt the questionnaire for the South African context. Permission letter (Appendix B) to pilot and adapt the questionnaire for use in this study was granted by the author.

The REDCap program, an online survey platform, was used to formulate the questionnaire based on the Brown, Swedlove, and Berry (2012) questionnaire. The questionnaire was piloted with six OT experts for content validity to ensure appropriateness for use as a questionnaire within the South African context. Thereafter, recommendations for changes and necessary adaptations were made to the questionnaire.

Once ethical clearance (Appendix D) was obtained data collection commenced. Information related to the study and the survey link were emailed to the three organisations OTASA, SAISI and RuReSA for distribution to the occupational therapists on their database (Occupational Therapy Association of South Africa, 2018) following permission from the organizations to distribute the survey (Appendix E and F) using REDCAP (Bailey, Hissong & Lape, 2015). Snowball sampling was also used to access respondents not registered with OTASA, SAISA and RuReSA to ensure a more representative sample (Polgar & Thomas, 2013).

The occupational therapists were required to read the information letter first before completing the questionnaire. Following this, the occupational therapists were required to click on the link provided to access the questionnaire. Consent was assumed when the respondents clicked the link to the survey and completed it; to ensure anonymity personally identifying information was excluded from the questionnaire (Bailey, Hissong & Lape, 2015).

Initially, the survey was open for a period of four weeks but owing to a poor response rate in the first two weeks, this was extended to 6-weeks to increase the return rate of the survey (Bailey, Hissong & Lape, 2015). A general survey recall time cannot be found, but literature indicates that the optimal recall time for surveys is 2-weeks based on the number of responses received (Bailey, Hissong & Lape, 2015). The survey became inactive after the set deadline to ensure the data portrayed an accurate representation of the population during the specific period (Bailey, Hissong & Lape, 2015). Following this, the researcher accessed the completed questionnaires through REDCap to analyse the data, compile the results and conclude the research. All incomplete surveys were excluded. Of 130 respondents who attempted the survey, only 118 respondents completed the survey.

### **3.6.2 Control of interfering variables**

Misinterpretation of survey questions and the return rate of the surveys were interfering variables (Bailey, Hissong & Lape, 2015). Misinterpretation occurs when respondents cannot understand the questions asked (Kielhofner, 2006). The variation in interpretation of the questions asked was reduced using an adapted version of a questionnaire, which has been subjected to a pilot study. Kielhofner (2006:101) has asserted that “By doing a pilot study, an investigator can find out if respondents can reasonably understand the questions and respond to the questions”.

The return rate of surveys is compromised when communicating via online platforms as opposed to face-to-face communication (Taylor, 2017). This could be due to the ‘out-of-sight-out-of-mind’ concept and the demanding work schedules of respondents. For this reason, a reasonable response rate is estimated at 20% (Taylor, 2017). To ensure a sufficient response rate, the survey was sent out via the three online platforms. Snowball sampling, where existing respondents shared the survey link with potential secondary respondents, was also used to allow for a greater number of responses (Polgar & Thomas, 2013; Taylor, 2017).

### **3.6.3 Data analysis**

Quantitative review of data calls for the condensation of results from several data sheets into a single data sheet. For this study, the quantitative data was coded and entered in REDCap for statistical analysis. REDCap is a secure internet platform which is used to



create and manage online databases and surveys. REDCap offers many different tools which can be tailored to the type of data collection strategy the researcher chooses. It provides automated export processes for fast and efficient data downloads to Excel and other common statistical packages (SPSS, SAS, Stata, R). It further contains a built-in project calendar, a scheduling module, ad hoc reporting tools, and advanced features, such as branching logic, file uploading, and calculated fields.

Statistical analysis was then applied to this data through inferential and descriptive statistics (Polgar & Thomas, 2013; Bailey, Hissong & Lape, 2015). Nominal data including gender, age, place of study and the training received; and ordinal data including year of graduation, the number of years practiced, and the type of degree held, was obtained. In conjunction with ordinal data, descriptive statistics were analysed using frequencies and medians (Bailey, Hissong & Lape, 2015). The data was then recorded in tables and in graph formats to represent the findings in a simplified manner. Descriptive statistics (measures of) and central tendency (frequency counts and percentages) were employed to display the results (REDCap, 2018).

### **3.7 Ethics**

Ethical clearance was required and obtained from the Human Ethics Research Committee (Ethical clearance number: M181053) at the University of the Witwatersrand prior to commencement of data collection (Appendix D). Written permission was also received from both RuReSA and OTASA to use their databases.

To ensure that respondents understood the purpose of the study, a participant information sheet and consent form (Appendix H and I) were included in the online questionnaire emailed out to all potential respondents. Informed consent was implied by respondents completing the online questionnaire as they were required to click 'yes' on the survey link to continue to the survey. As stipulated on the participant information sheet, respondents retained the right to withdraw from the study at any time without a personal consequence. Occupational therapists who did not agree to be part of the study were able to click 'no' on the survey link to discontinue the survey. These occupational therapists were excluded.

The use of a REDCap online questionnaire meant that the researcher did not have physical contact with the potential respondents therefore ensuring anonymity (Taylor,

2017). Anonymity was also ensured by the exclusion of personally identifiable information from the questionnaire. With the use of REDCap all the information was pooled into one place, to ensure information could not be traced back to the individual participant. Each survey was labelled using a generated research identification number to provide third-party anonymity.

Confidentiality was also maintained using the generated research identification number. The information that was gathered, was stored in a password protected computer which was solely used by the researcher. Both the researcher and supervisor were provided access to the data from the computer. The respondents were also informed about their right to access the results upon request made to the researcher.

## **CHAPTER 4: RESULTS**

### **4.1. Introduction**

The results from the data collection process of this study are outlined in this chapter. The socio-demographic profile of the respondents is summarised, followed by results concerning the awareness that occupational therapists have regarding sleep dysfunctions in children and possible interventions. Furthermore, the results for the current sleep interventions provided by occupational therapists to children in SA and the training occupational therapists receive to prepare them to offer sleep interventions to children with sleep disorders in SA, is outlined. The results are outlined per objective and presented through descriptive and non-parametric statistics.

### **4.2. Outline of responses received from the survey**

In total, 130 respondents across the nine provinces returned the questionnaire, of which 118 questionnaires were complete. The analysis of the results showed that of these respondents, 114 occupational therapists provided services to children in their practice. A required sample for this study was set at 105 (Bartlett, et al., 2001). Thus, the responses received in this study gave a more representative sample through which conclusions related to the provision of sleep interventions by occupational therapists working with children in SA could be drawn. Figure 4.1. outlines the responses received from all respondents including those providing OT services to children within private and public health sectors in SA.

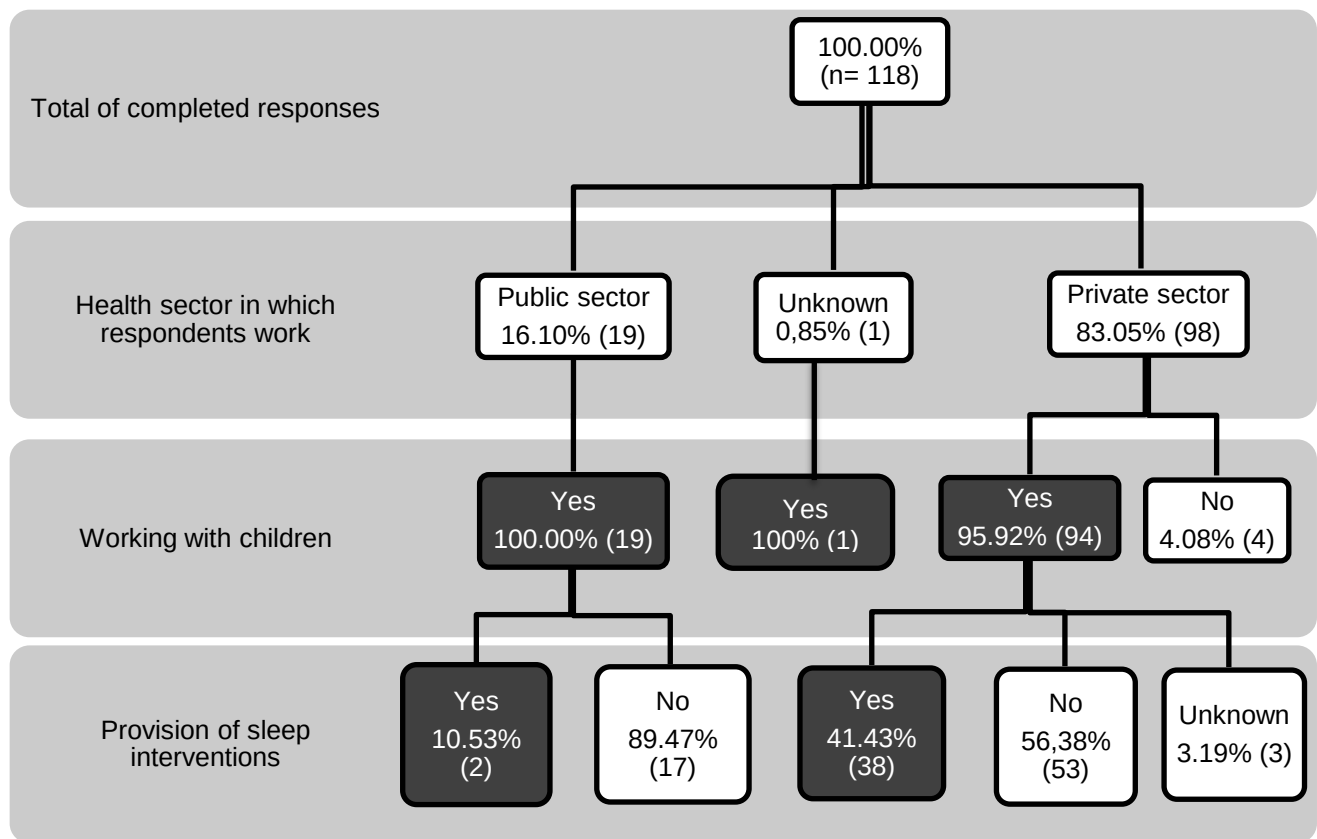


Figure 4.1: The number of responses received (n=118).

Majority of the respondents (n=98, 83.05%) reported to work in the private health sector, of which (n=94, 95.92%) provide services to children. Only 41.43% (n=38) of these occupational therapists were identified to provide sleep interventions. All respondents from the public sector (n=19, 100%) reported that they provide services to children, of this number only 10.53% (n=2) reported to provide sleep interventions. This displays that there may be a gap in the number of occupational therapists providing OT sleep intervention to children with sleep disorders.

### 4.3. The socio-demographic profile of the respondents

Table 4.1: The demographics of the sample (n=114)

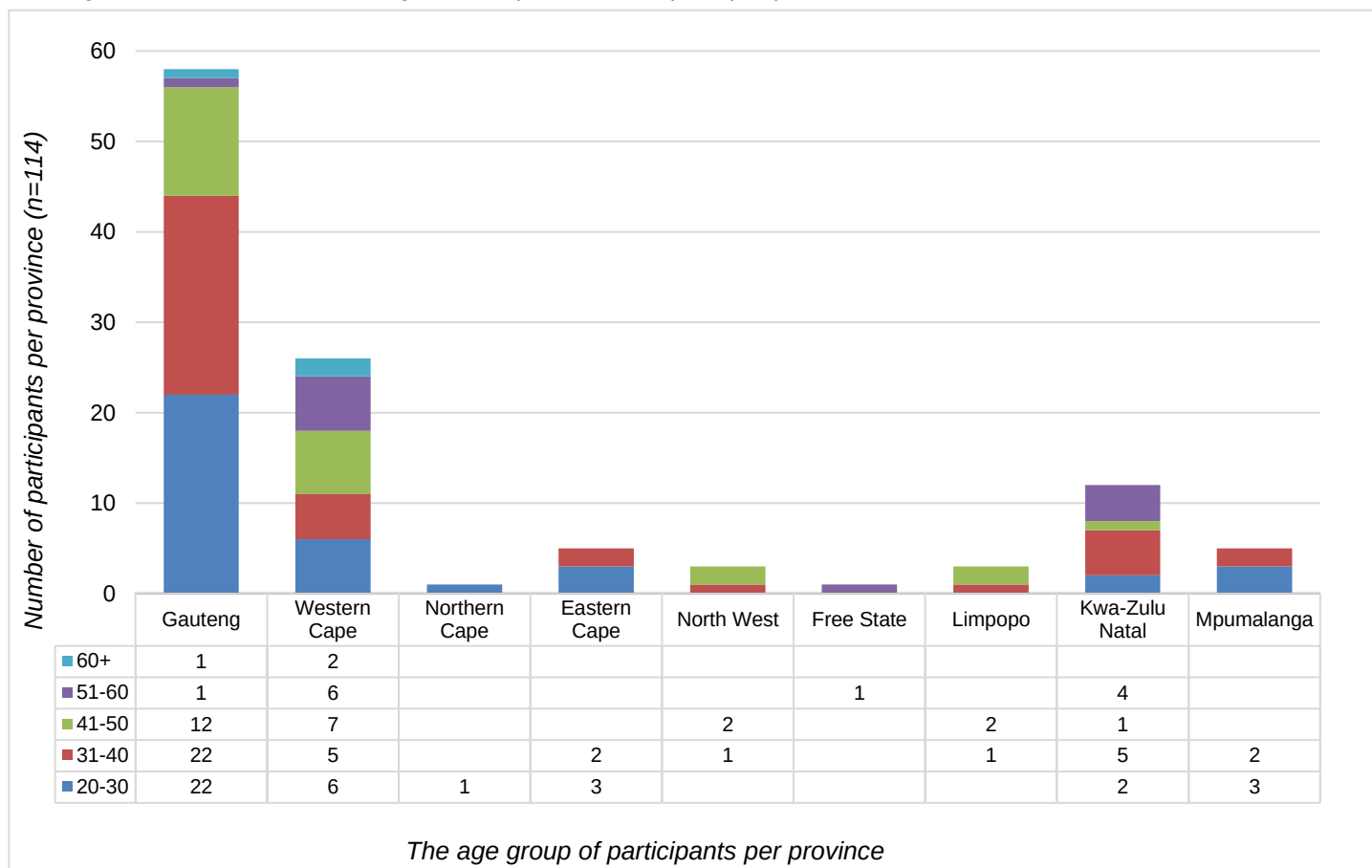
|                                                    | Number of respondents (n=114) | Percentage (%) |
|----------------------------------------------------|-------------------------------|----------------|
| <b>Gender of respondents</b>                       |                               |                |
| Female                                             | 114                           | 100.00         |
| <b>Years of experience in occupational therapy</b> |                               |                |
| <5                                                 | 30                            | 26.32          |
| 6-10                                               | 17                            | 14.91          |
| 11-15                                              | 20                            | 17.54          |
| 16-20                                              | 13                            | 11.40          |
| 21-25                                              | 13                            | 11.40          |
| 26-30                                              | 10                            | 8.77           |
| 31-35                                              | 5                             | 4.39           |
| 36-40                                              | 6                             | 5.26           |
| <b>Level of qualification</b>                      |                               |                |
| Bachelor of Occupational therapy                   | 102                           | 89.47          |
|                                                    |                               |                |
| Master of Occupational therapy                     | 9                             | 7.89           |
|                                                    |                               |                |
| Doctor of Occupational therapy                     | 3                             | 2.63           |
|                                                    |                               |                |
| <b>Work Settings</b>                               |                               |                |
| Private practices                                  | 87                            | 52.10          |
| Schools                                            | 55                            | 32.93          |
| Hospitals                                          | 19                            | 11.38          |
| Out-patient Clinics                                | 1                             | 0.60           |
| Other                                              | 5                             | 2.99           |

All respondents were female, and their years of experience in OT practice ranged from 5 to 40 years. 26.32% (n=30) of respondents, had less than 5 years' experience. 89.47% (n=102) of respondents have an undergraduate degree, with the remainder having a masters' (n=9; 7.89%) or a PhD (n=3; 2.63%) qualification. Additionally, 52.10% (n=87) of respondents work in private practice settings and only one (0.6%) respondent reported to work in an out-patient clinic. Five (2.99%) respondents reported to work in

other facilities, namely a non-governmental organisation (NGO), Community health, a University, and a Medico-legal practice.

Figure 4.2. below represents the number and age group of respondents per province (n=114).

Figure 4.2: The number and age of occupational therapists per province



50.88% (n=58) of all the respondents reported to practice in Gauteng and 22.81% (n=26) were practicing in the Western Cape Province. The least number of respondents were from the Northern Cape with 0.85% (n=1) and Free State with 0.85% (n=1) respectively. 32.46% (n=37) of the respondents were between the ages of 20 to 30 and 33.33% (n=38) of respondents were between the ages of 31 to 40.

## 4.4 The awareness of sleep disorders in children

### 4.4.1 Age ranges and diagnostic groups

Figure 4.3. below presents the age range and diagnostic groups for children treated in occupational therapy.

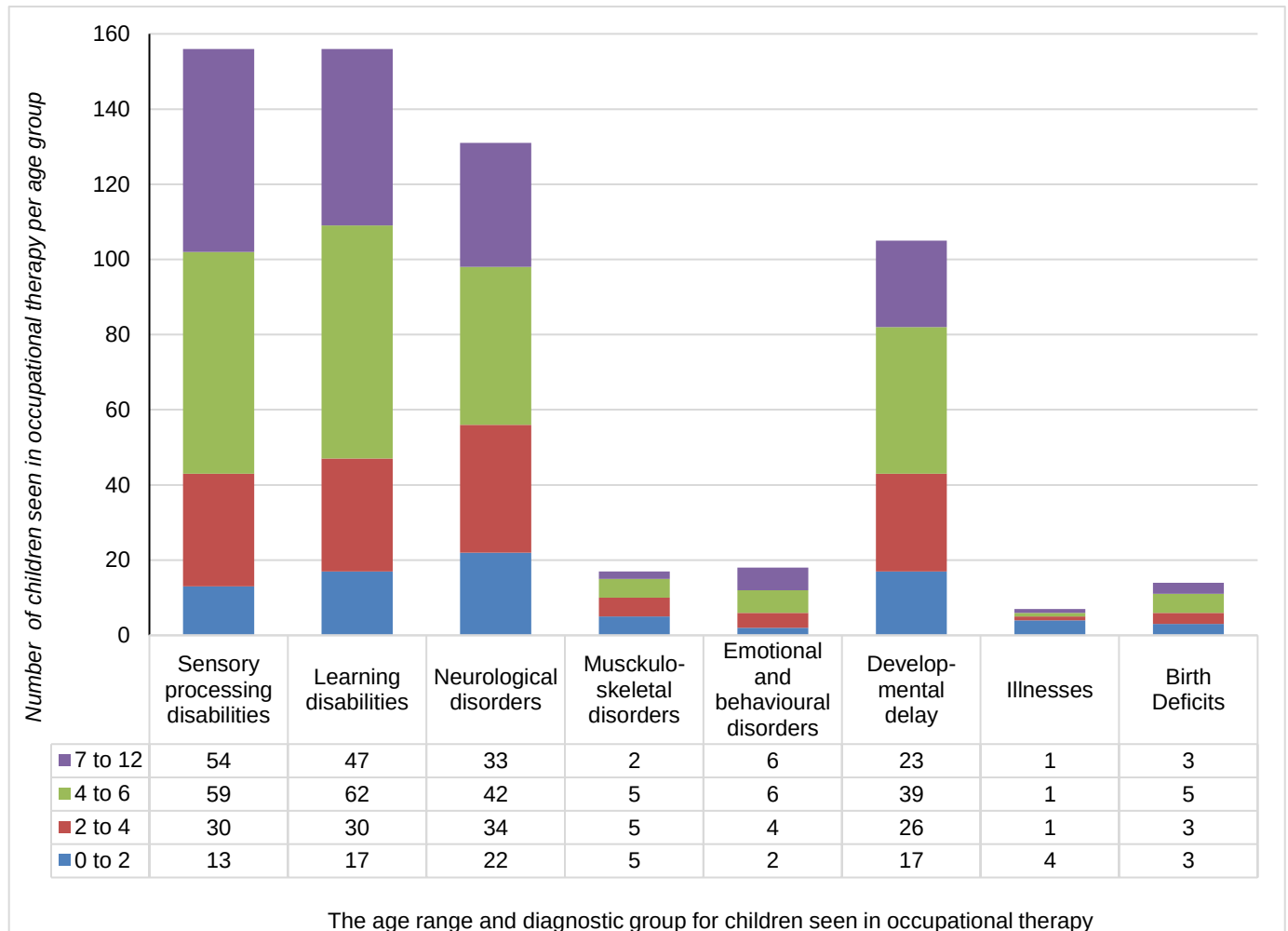


Figure 4.3: The age range of and diagnostic groups for children treated in occupational therapy

To establish the age range and diagnostic groups of children treated by occupational therapists, respondents were asked to list the types of diagnoses and age groups most prevalent on their caseload. The most predominant diagnostic group of children on the respondents' caseload were those with learning disabilities (n=156; 27.65%) and sensory processing disabilities (n=156; 27.65%), this was followed by those with neurological disorders (n=131; 23.23%) and developmental delay (n=105; 18.62%). The least treated groups were those with Illnesses, including human immunodeficiency virus (HIV), tuberculosis (TB) and severe malnutrition (n=7; 1.24%). The age range for

children seen included those between the ages of 0 and 12 of which majority were between the ages of four and six-years-old (n=219; 38.83%).

The table 4.2. below represents the conditions and disorders, reported by participants, in each diagnostic group of children, treated in OT.

Table 4.2: Conditions in the diagnostic groups for all children treated in occupational therapy.

| Diagnostic group                | Reported Conditions and disorders       | Number of reported conditions and disorders (n= 226) | Percentage % |
|---------------------------------|-----------------------------------------|------------------------------------------------------|--------------|
| Sensory processing disabilities | Sensory processing disorder             | 55                                                   | 24.34        |
|                                 | Dyspraxia                               | 11                                                   | 4.87         |
|                                 | Sensory modulation disorder             | 5                                                    | 2.21         |
| Learning disabilities           | Attention Deficit Hyper-active disorder | 35                                                   | 15.49        |
|                                 | Attention Deficit disorder              | 8                                                    | 3.54         |
|                                 | Gross/Fine motor impairments            | 3                                                    | 1.33         |
|                                 | Dyslexia                                | 2                                                    | 0.88         |
| Neurological disorders          | Autistic spectrum disorder              | 40                                                   | 17.70        |
|                                 | Cerebral palsy                          | 24                                                   | 10.62        |
|                                 | Poor tone                               | 3                                                    | 1.33         |
|                                 | Developmental Co-ordination disorder    | 3                                                    | 1.33         |
|                                 | Pervasive developmental disorder        | 2                                                    | 0.88         |
|                                 | Epilepsy                                | 2                                                    | 0.88         |
|                                 | Tourette's syndrome                     | 1                                                    | 0.44         |
|                                 | Down syndrome                           | 1                                                    | 0.44         |
|                                 | Intellectual disorder                   | 1                                                    | 0.44         |



|                                           |                            |   |      |
|-------------------------------------------|----------------------------|---|------|
|                                           | Sleep disorders            | 1 | 0.44 |
| <b>Musculoskeletal disorders</b>          | Traumatic brain injury     | 3 | 1.33 |
|                                           | Bone fractures/deformities | 2 | 0.88 |
|                                           | Visual impairments         | 2 | 0.88 |
|                                           | Burns                      | 2 | 0.88 |
|                                           | Hand injuries              | 1 | 0.44 |
|                                           |                            |   |      |
| <b>Emotional or behavioural disorders</b> | Anxiety                    | 4 | 1.77 |
|                                           | Attachment disorder        | 2 | 0.88 |
|                                           | Trauma/PTSD                | 1 | 0.44 |
|                                           | Conduct disorder           | 1 | 0.44 |
| <b>Birth deficits:</b>                    | Spina bifida               | 2 | 0.88 |
|                                           | Prematurity                | 2 | 0.88 |
|                                           | Foetal alcohol syndrome    | 1 | 0.44 |
|                                           | Birth asphyxia             | 1 | 0.44 |
|                                           | Encephalopathy             | 1 | 0.44 |
| <b>Illnesses:</b>                         | Severe acute malnutrition  | 2 | 0.88 |
|                                           | HIV                        | 1 | 0.44 |
|                                           | TB                         | 1 | 0.44 |

Several respondents further highlighted the conditions and disorders within each diagnostic group treated in occupational therapy. Most respondents reported to treat sensory processing disorder (n=55, 24.34%), whilst 17.70% (n=40) reported to treat autistic spectrum disorder. 15.49% (n=35) respondents also reported to treat attention deficit hyper-active disorder.

#### 4.4.2: Awareness of assessment methods

Figure 4.4. below represents the method of assessments which the respondents indicated could be used to identify sleep disorders amongst children seen in occupational therapy (n=109).

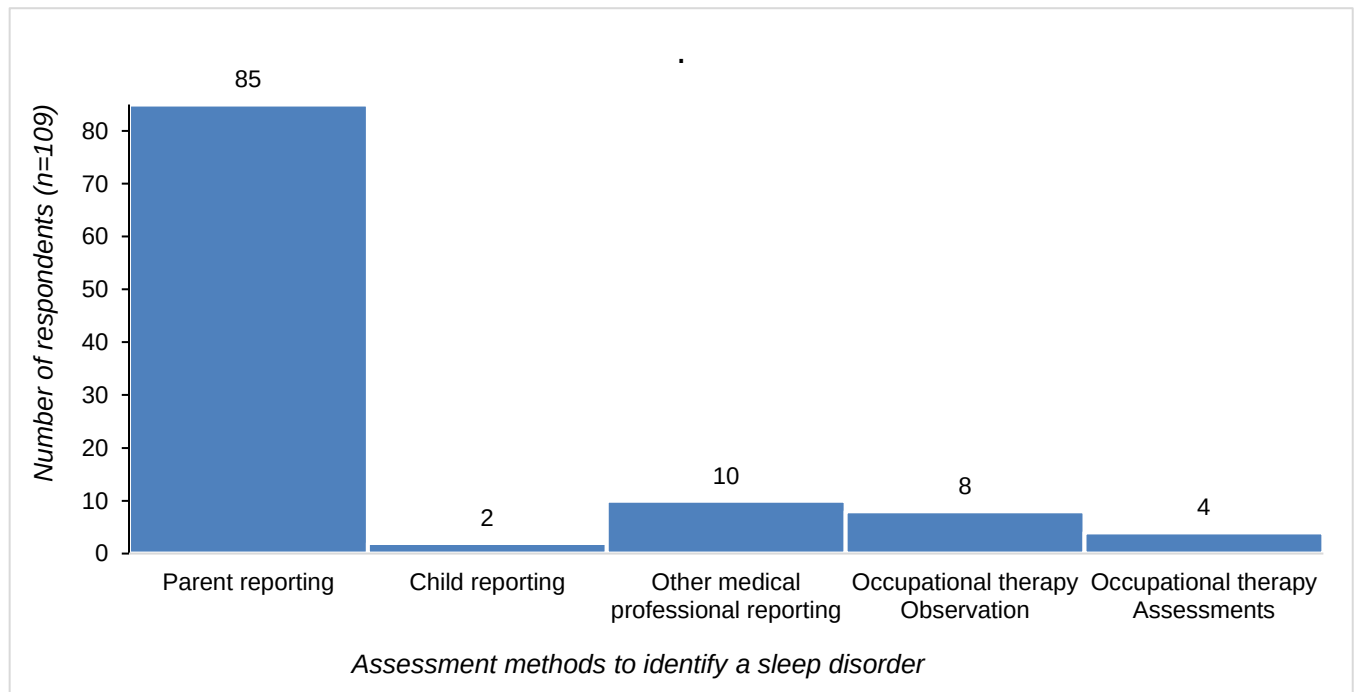


Figure 4.4: Assessment methods to identify sleep disorders in children

Of the 114 respondents who were required to identify possible occupational therapy assessment methods that could be used to identify sleep disorders in children, only 109 indicated the assessment method they were aware of. Many of the respondents (n=85, 77.98%) indicated parental reporting as an assessment method which could be used to identify sleep disorders amongst the children seen in occupational therapy. Only four (3,36%) respondents indicated the need for an occupational therapy assessment in identifying sleep disorders in children. Very few respondents (n=4, 3.51%) indicated child reporting as a method that could be used to identify sleep disorders amongst children. This may be attributed to the fact that majority of the children seen by the respondents were between the ages of 4 and 6, therefore, this method could be considered a less reliable way of gathering this information.

#### 4.4.3: Awareness of assessment tools

Figure 4.5. below describes the assessment tools which respondents indicated could be used to determine sleep disorders in children (n=114).

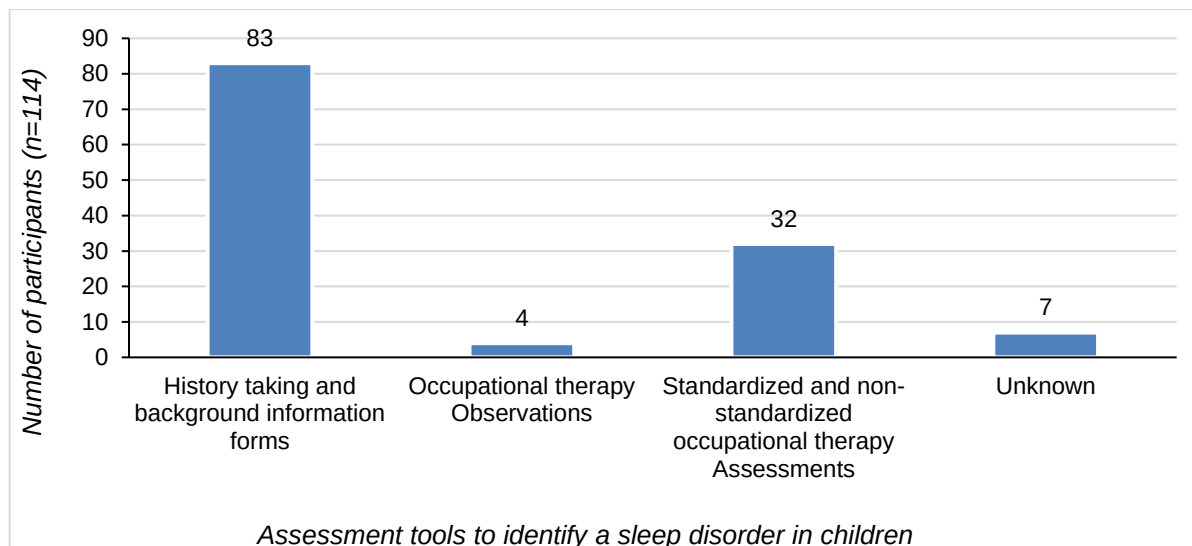


Figure 4.5: Occupational therapy assessment tools to identify sleep disorders in children.

Respondents were required to identify the assessment tools they deemed useful in gathering the information to identify sleep disorders in children. 72.81% (n=83) of the respondents indicated background information forms could be used to gather information with various role players in the child's life. These role players could include caregivers, teachers and other healthcare professionals present in the child's life. Few respondents were aware of standardized and non-standardized occupational therapy assessment tools (n=32; 25%) that could be used to identify sleep disorders in children. 6% (n=7) of respondents were not aware of the type of assessment tool which could be used to identify sleep disorders. This is not surprising as many of the respondents in both private and public health sector (n=68; 59.64%) indicated that they did not provide interventions for sleep disorders in the children they treated within their practice.

#### 4.4.4 Awareness of intervention methods

Figure 4.6. below outlines the respondents' awareness of the occupational therapy interventions that can be provided to children with sleep disorders (n=114).

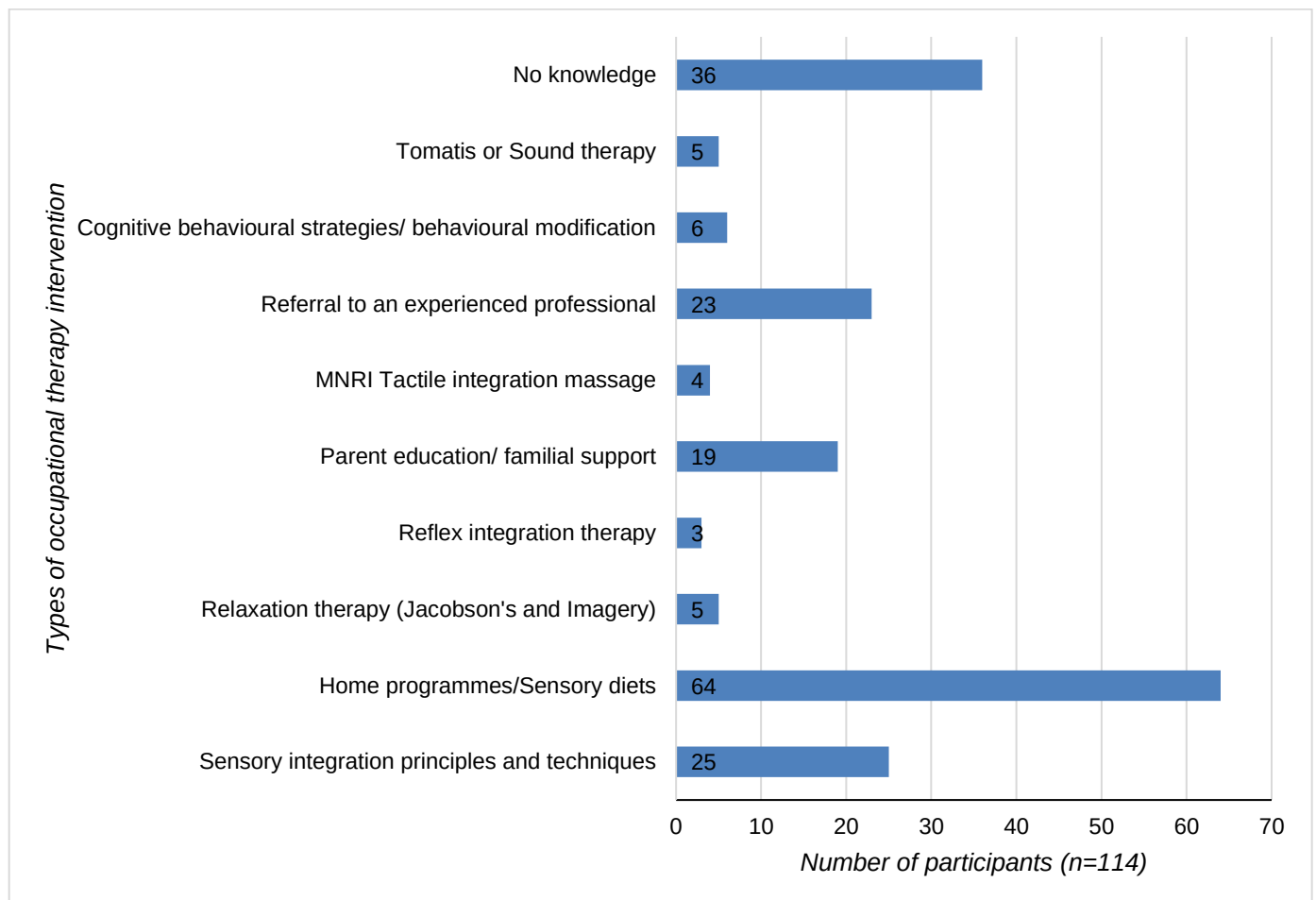


Figure 4.6: Occupational therapy interventions that could be used for children with sleep disorders.

Respondents were required to indicate the types of intervention methods they considered useful for treating sleep disorders in children. Many respondents identified sensory diets and home programs (n=64; 56.14%) and sensory integration principles and techniques (n=25; 21.92%) as intervention methods which could address dysfunctions amongst children diagnosed with sleep disorders. The least number of respondents considered the use of reflex integration therapy for sleep disorders in children (n=3; 2.63%). It is important to note that, 31.58% (n=36) of respondents indicated that they had no knowledge of occupational therapy interventions that can be used to treat sleep disorders in children.

## 4.5 The sleep interventions provided by occupational therapists working with children in South Africa and their perceived effectiveness.

### 4.5.1 The estimated prevalence of sleep disorders in children seen in occupational therapy

Figure 4.7. below displays the estimated prevalence of sleep disorders in children treated by the occupational therapists who reported to provide sleep interventions in their practice (n=40).

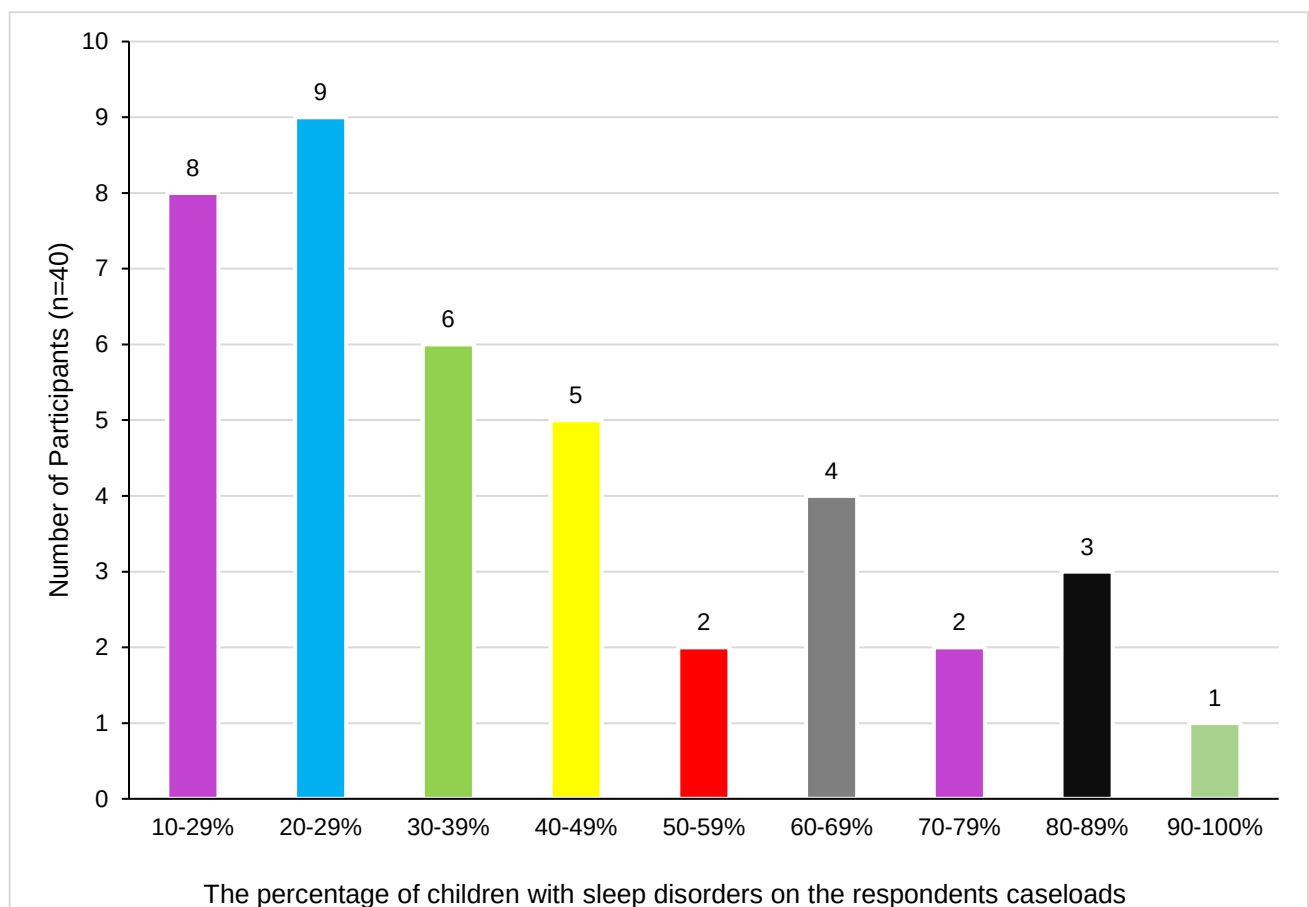


Figure 4.7: The estimated percentage of children with sleep disorders seen in occupational therapy.

20% (n=8) of respondents indicated that 10-19% of children in their caseload presented with sleep disorders, and 22,5% (n=9) of respondents indicated that 20-29% of children in their caseload had a sleep disorder. Only one participant (2.5%) reported to see 90-100% of children with sleep disorders on their caseload.

#### 4.5.2 The use of occupational therapy sleep assessments

Figure 4.8. below displays the use of occupational therapy sleep assessments for sleep disorders in children (n=114).

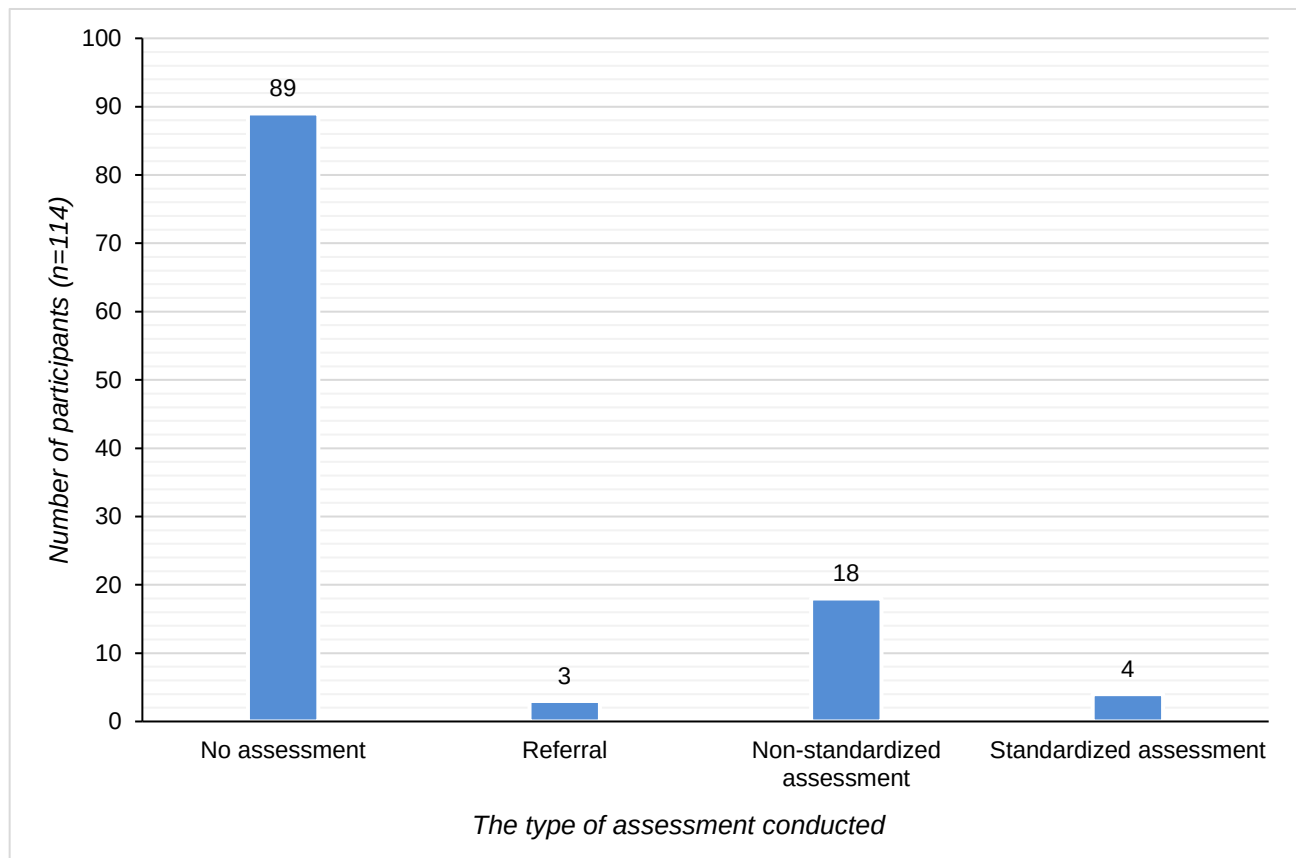


Figure 4.8: The number of occupational therapists assessing sleep in children and the type of assessment used.

Most of the respondents (n=89, 78.07%) who reported to provide occupational therapy services to children indicated that they do not conduct any assessment for sleep disorder in children. 3% (n=2,63) of respondents referred clients to sleep clinics and 15,79% (n=18) of respondents utilised informal assessments to assess for a sleep disorder.

Informal assessments included questionnaires such as an in-house Activities Clock Questionnaire; background history forms which focused on bedtime and sleep routine, sleep environment, sensory behaviours, electronic media viewing routines; and poor bedtime habits such as disturbed sleep, bed wetting, nightmares/terrors, and what soothes these.

Only 4 (3,51%) respondents reported using standardised assessments to identify sleep disorders. This included the Child Sensory Profile 2 (Dunn, 2014), Sensory Integration assessment (Ayres, 1996), Tomatis Listening Test System (Tomatis, 1996), and CBTi: Cognitive behavioural therapy for insomnia (Perlis, et al., 2005).

#### 4.5.3 *The role occupational therapists play in providing intervention for sleep disorders in children.*

Figure 4.9. Below presents the role occupational therapists take when providing interventions for sleep disorders in children (n=40).

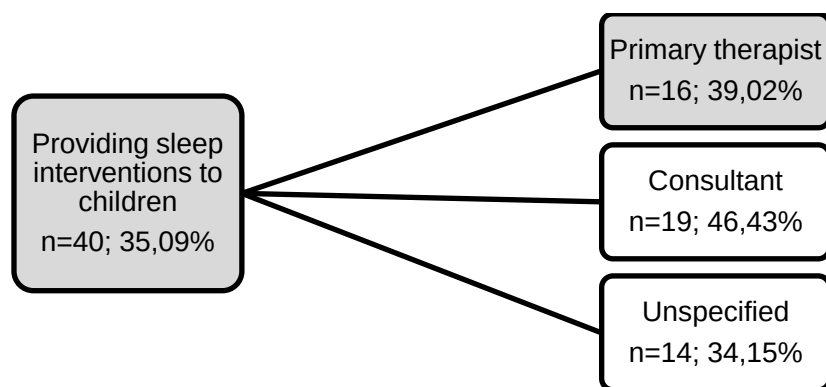


Figure 4.9: The role of respondents in providing sleep interventions to children.

Of the 114 respondents providing interventions to children, only 35,09% (n=40) provide sleep interventions for children. 13,55% (n=16) reported to be a primary therapist, 16,10% (n=19) of respondents provide consultation. 11,86% (n=14) respondents did not specify their role in the provision of interventions to children with sleep disorders.

#### 4.5.4 The use of occupational therapy sleep interventions

Figure 4.10. below represents the type of occupational therapy interventions provided to children with sleep disorders.

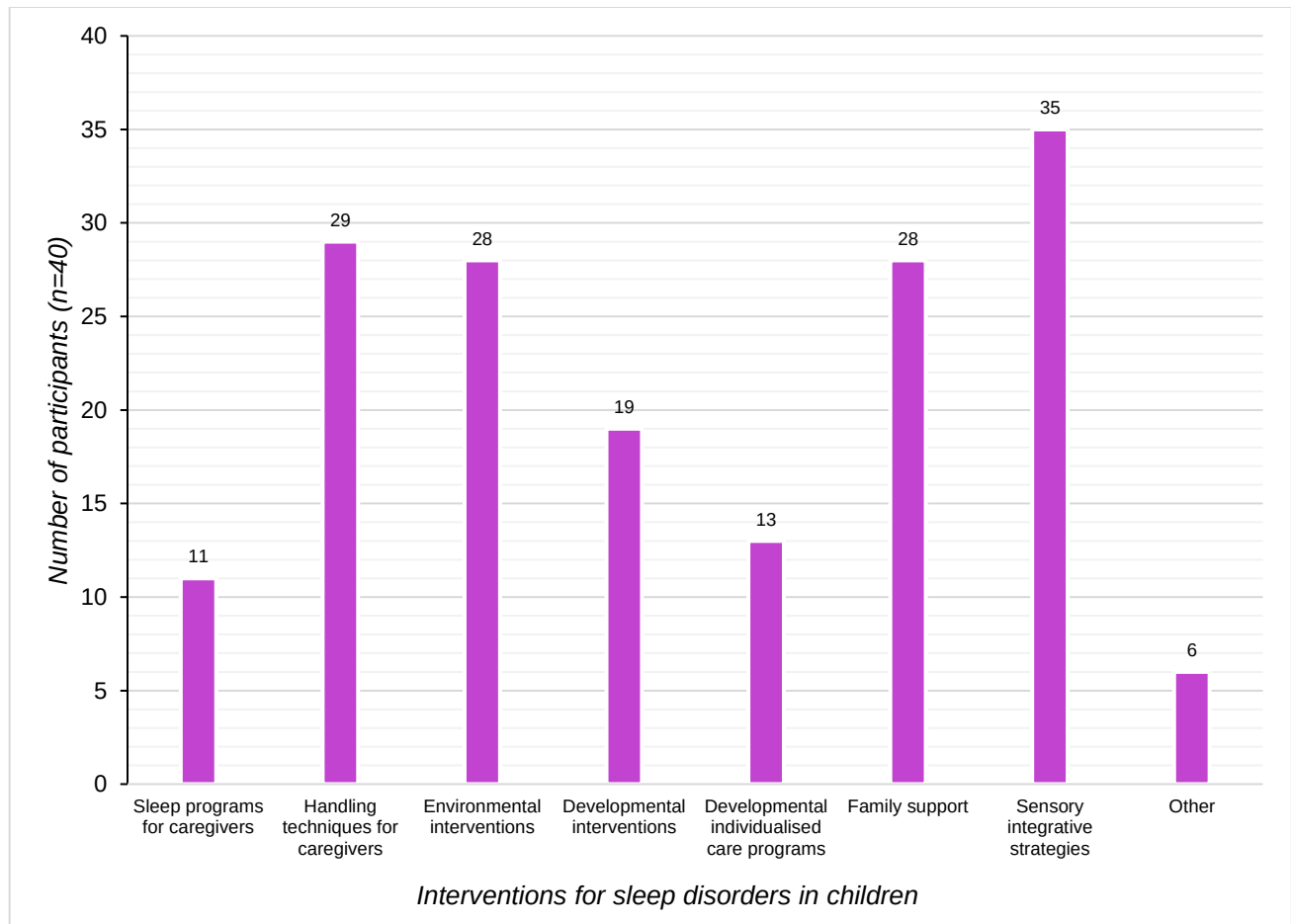


Figure 4.10: The types of occupational therapy interventions provided to children with sleep disorders

From the respondents who provide sleep interventions for children, 20.71% (n=35) stated that they provide sensory integration strategies to address sleep disorders in children. Developmental interventions (n=19; 11.24%), developmental individualised care programs (n=13; 7.69%) and sleep programs for caregivers (n=11; 6.51%) were amongst the interventions utilised to address dysfunctions amongst children with sleep disorders but they were utilised by few respondents.

5.98% (n=6) of respondents identified other sleep interventions they used in their practice namely Relaxation Therapy Exercises, Behavioural management, Biofeedback and Neurofeedback, and Complimentary programs to occupational therapy such as Tomatis therapy, Primary Reflex Integration and Neurodevelopmental strategies.



#### 4.5.5 The amount of time spent providing interventions for sleep disorders in children and the perceived effectiveness thereof.

Figure 4.11., below, displays a description of the amount of time spent providing sleep education to the child and the caregiver for sleep disorders in children (n=40).

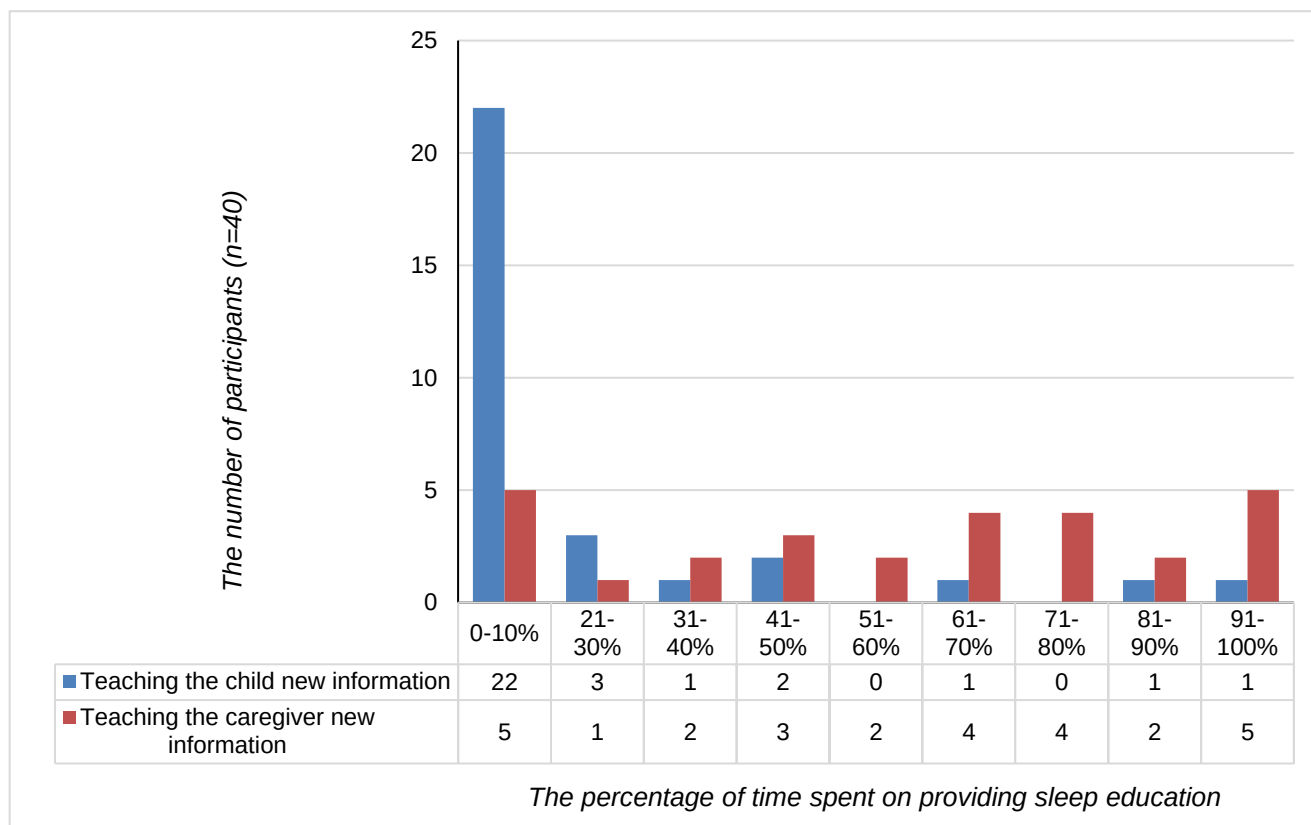


Figure 4.11: The time spent on teaching the child or caregiver new information about sleep interventions

Majority of respondents indicated spending more time educating the caregiver about the sleep techniques than a child. Although five (17.86%) respondents reported to provide 0-10% of their time on sleep education for the caregiver; the majority of respondents provided more sleep education to the caregiver. It is evident from the results that most respondents spent less time providing sleep education directly to children with 22 (70.98%) reporting to spend only 0-10% of their time providing sleep education to the child. This could be related to the fact that majority of the children in their caseload were younger ranging between 4 to 6 years old.

Figures 4.12., below, displays a comparison between the perceived effectiveness in providing sleep education to the child and the caregiver for sleep disorders in children (n=40).

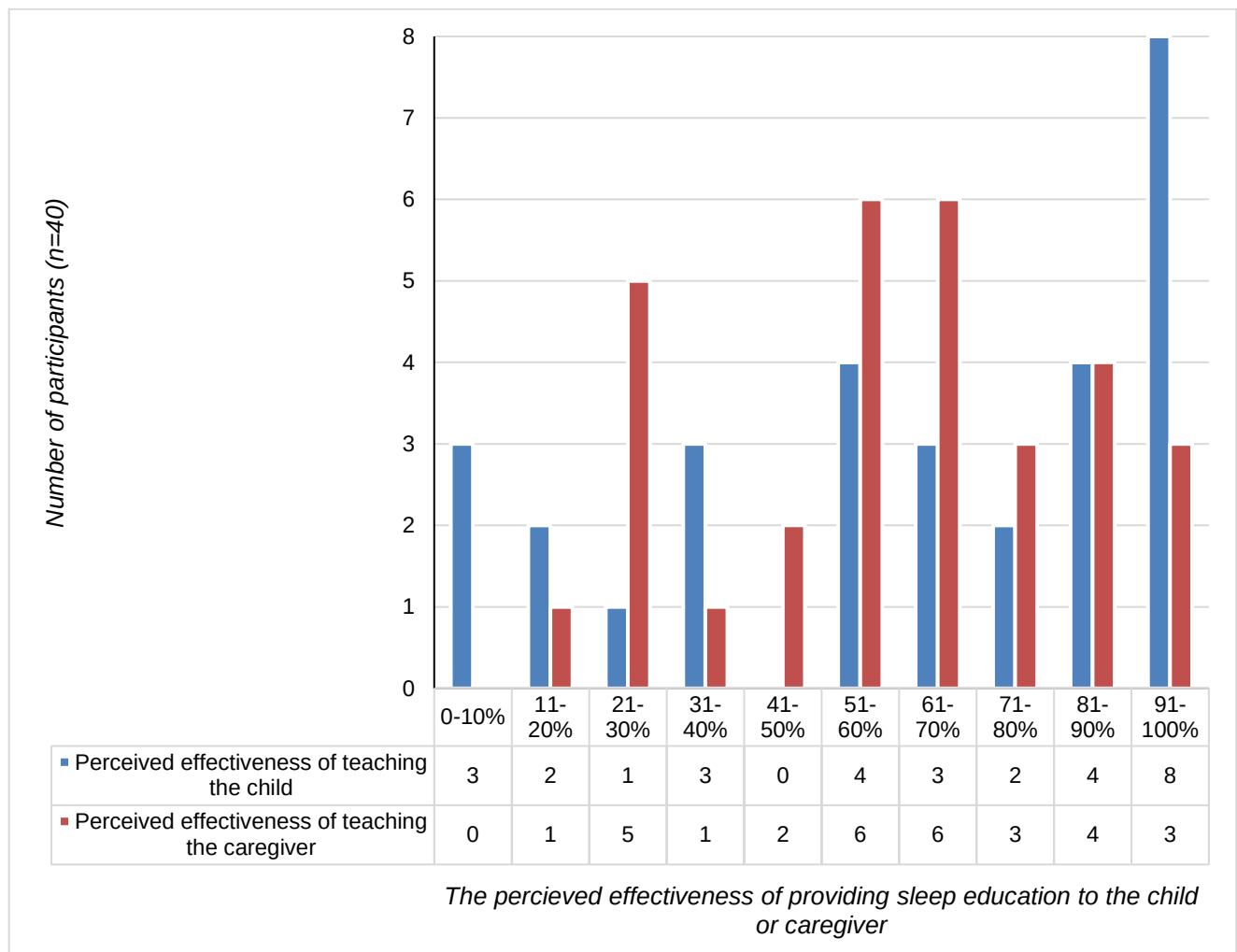


Figure 4.12: The perceived effectiveness of teaching the child or caregiver new information about sleep techniques

With regards to the respondents' perceptions on the effectiveness of their sleep education with the child or caregiver; eight (26.67%) respondents felt that sleep education to the child was 91-100% effective whilst twelve (38.71%) respondents reported a 51-70% effectiveness in providing sleep education to the parent. This is conflicting considering that the majority of the respondents reported that they spent more of their time educating caregivers on the sleep techniques than they did to the child.

#### 4.5.5 The perceived barriers and potential facilitators to implementing sleep interventions in occupational therapy

Figure 4.13 below represents the potential barriers and possible facilitators to implementing interventions in occupational therapy.

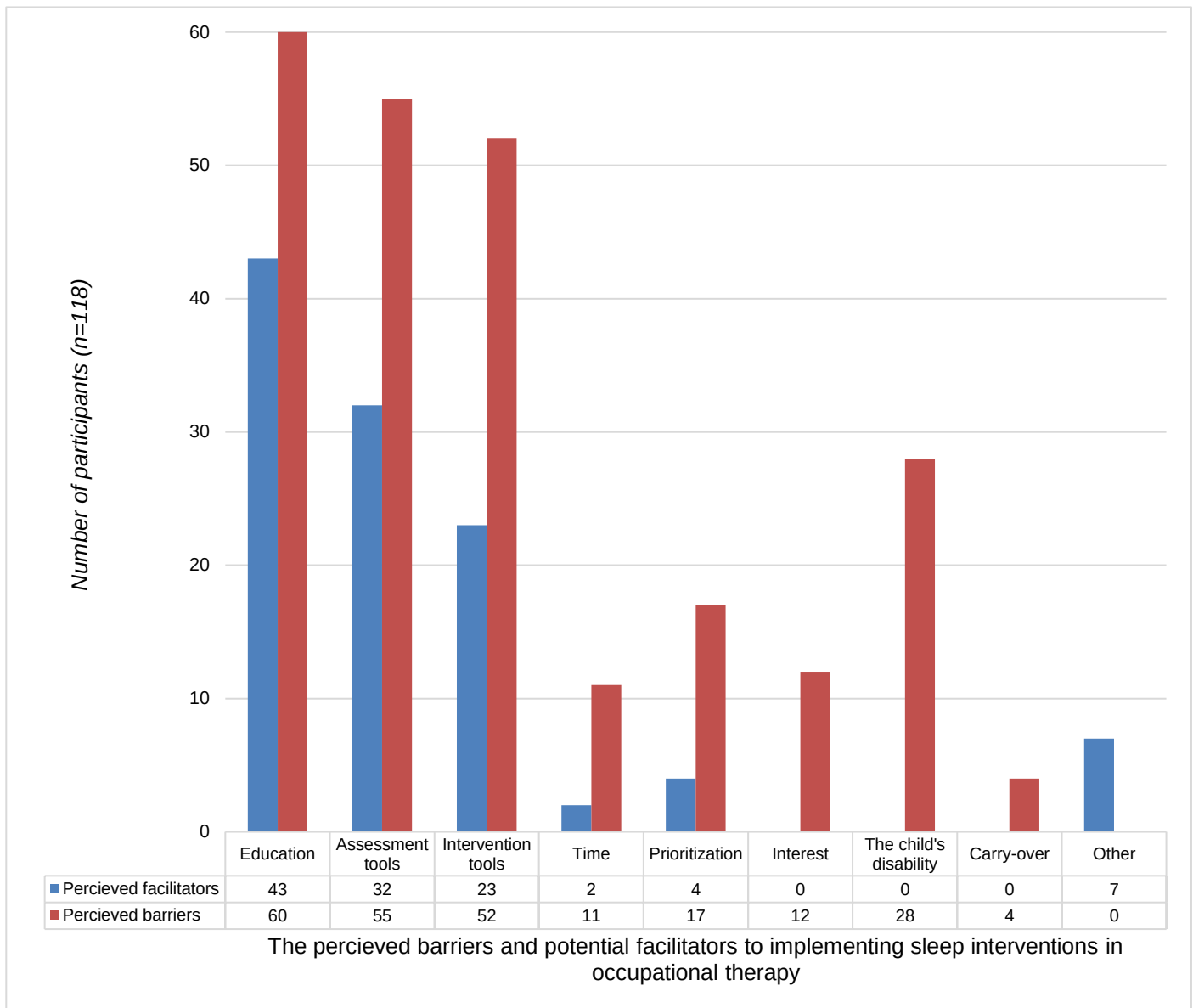


Figure 4.13: The barriers and facilitators to providing occupational therapy sleep intervention to children.

All 118 respondents identified perceived barriers to their ability to implement sleep interventions to children. Sixty respondents (50,85%) highlighted insufficient training or a lack of access to training as a barrier affecting their ability to offer effective treatment to children with sleep disorders. 46,61% (n=55) of respondents reported that a lack of assessment tools for sleep disorders was a barrier to sleep interventions. Likewise, a lack of intervention tools to be used with children with sleep disorders was a barrier to

sleep interventions by respondents (n=52, 44.06%). 23,73% (n=28) of respondents included the child's physical or cognitive (dis)ability as a barrier to sleep interventions. Four respondents (3,39%) further reported on poor carryover of home programs for sleep interventions as a barrier.

Respondents were also requested to report on potential facilitators which would enable them to deliver more effective occupational therapy sleep interventions for children with sleep disorders. 36,44% (n=43) of respondents highlighted a need for more education on sleep and sleep intervention in undergraduate, post-graduate and other courses, research, and guidelines/protocols. A need for standardised assessment tools was highlighted by 27,12% (n=32) of respondents, and 19,49% (n=23) of respondents reported a need for intervention tools. Lastly, 5,93% (n=7) of respondents reported on other strategies such as monitoring medication and a need for better public/professional awareness of the significance/impact of sleep disorders on a child's function, learning, and development.

#### 4.6 The training received by occupational therapists to offer sleep interventions to children.

Figure 4.14 displays the training received by occupational therapists to provide interventions for sleep disorders in children.

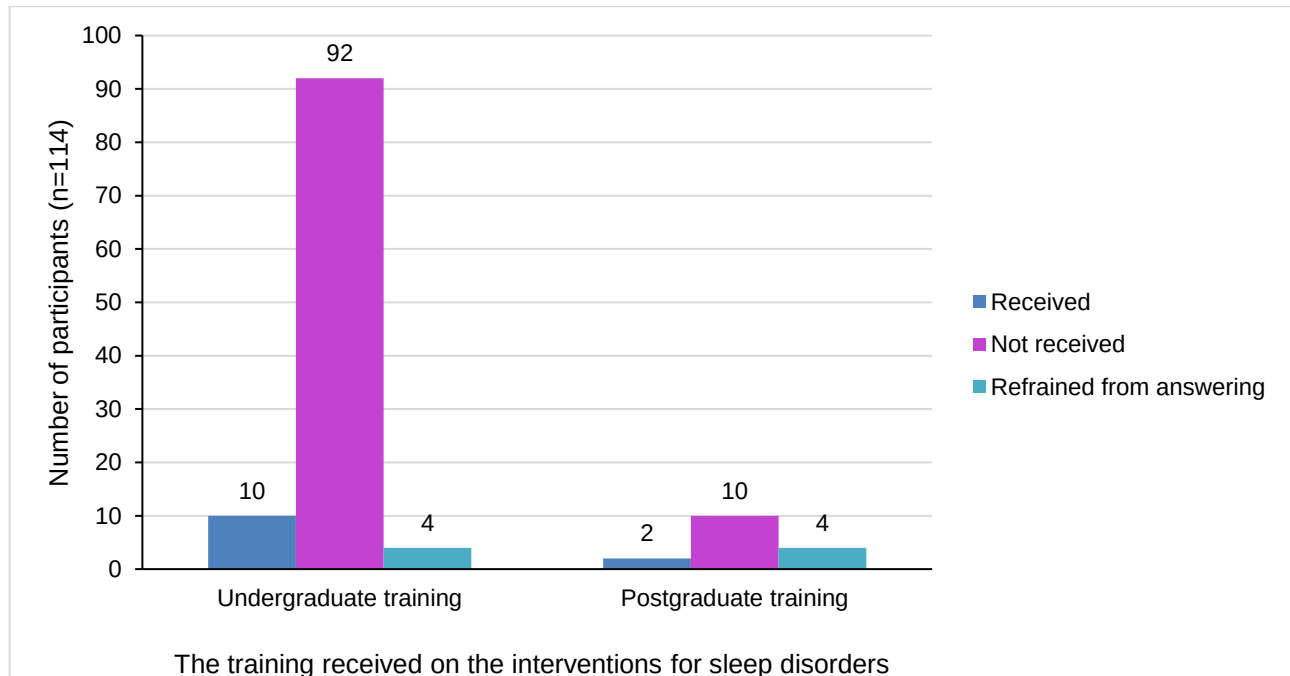


Figure 4.14: The training received by occupational therapists in their undergraduate and postgraduate studies.

Of the 114 respondents, 8.77% (n=10) respondents stated that they received some training on sleep interventions during their undergraduate training. The undergraduate training included self-study material on rest and sleep, a lecture on sleep as an occupational performance area, a lecture on the importance of sleep and then possible interventions, a lecture on sleep hygiene, routines, neurology, and factors influencing sleep, a lecture concerning sleep as part of a balanced lifestyle and lectures on the benefits of good quality sleep.

During the time of this study, 1.75% (n=2) of respondents reported to having received postgraduate training on sleep interventions. This training included a lecture on sleep intervention principles and lectures concerning sensory diets and the effects of medication, routinisation as well as cell phone applications on sleep.

## **4.7 Conclusion**

114 respondents provided occupational therapy services to children. More than a quarter of these respondents had less than 5 years' experience working with children, and only a few occupational therapists reported to provide sleep interventions to children. The majority of the respondents in the study were from the Private sector and practiced in the Gauteng province and the Western Cape Province.

The most common age group of children treated in occupational therapy were between the ages of four to six-year-olds. The most common health conditions treated by the respondents included Learning disabilities, Neurological disorders, Sensory based dysfunctions, and Developmental delay.

Many respondents recognised that sensory diets/home programs, sensory integration techniques could be used to address sleep disorders in children, however, referrals to other professions were used more often by the respondents. This could be linked to a lack of awareness regarding occupational therapy sleep interventions.

Insufficient awareness on the assessment methods and tools, limited education on sleep and sleep disorders in the undergraduate and postgraduate training were associated with the decreased provision of sleep interventions to children seen in occupational therapy. Likewise, respondents reported more education would enable them to deliver more effective occupational therapy sleep interventions to children with sleep disorders.

## **CHAPTER 5. DISCUSSION**

### **5.1 Introduction**

The aim of this study was to describe the interventions that occupational therapists working with children in both private and public health care settings offer to children with sleep disorders and the training received to offer such services. This chapter presents a discussion of the results with specific focus on the four objectives as outlined in chapter one.

The objectives of this study were to determine the socio-demographic profile of occupational therapists who provide sleep interventions to children, the awareness regarding sleep interventions for the child with sleep disorders, the types of occupational therapy sleep interventions provided by occupational therapists to children within the South African context and the perceived effectiveness of these, and the training they received related to the occupational performance domain of sleep and/or sleep interventions for the child.

### **5.2 Socio-demographic profile of occupational therapists providing sleep intervention for children**

All respondents in this study were female, the majority of which, had less than five years of experience (26.32%), and worked in the private health sector (83.05%) as appose to the public sector (16.1%) (Table 4.1 and figure 4.1). Most of the respondents were mainly from the Gauteng and the Western Cape provinces (Figure 4.2). Although there were very few respondents from the public health sector (16.1%), the results revealed that all respondents from the public health sector offered services to children.

It is important to note that the results do highlight the disparity between public and private healthcare when it comes to child healthcare. The findings are reflective of the current practice as far as access to childhood rehabilitation, including the provision of sleep interventions, is concerned where majority are offered in private health care as opposed to public healthcare (World Federation of Occupational Therapists., 2016). A study by Ned, Tiwari, & Buchanan (2020), reports that of occupational therapists in the private sector (74.8%) cater for 16% of the population while those who work in the public sector (25.2%) cater for 84% of the population.

The disparities between the health sectors could be linked to poor retention of occupational therapists in the public sector (Eager, 2017; Ned, Tiwari, & Buchanan., 2020). In South Africa, occupational therapists are placed in the public sector during their community service year, following their bachelor's degree (Watson, 2013). But following this year of service, many occupational therapists leave the public sector. Human resource moratoria in the public sector, due to financial constraints, may be one reason for this (Eager, 2017; Ned, Tiwari, & Buchanan., 2020). Human resource moratoria is an increasingly common occurrence in public healthcare.

Graduates often do not have the option, on completion of community service, to stay in the public sector, thus they seek employment in the private sector (Ned, Tiwari, & Buchanan., 2020). This is highlighted in the results of this study as more responses came from the private sector, specifically private practice (52.1%) and many of these respondents had less than 5 years of experience (26.32%).

This can negatively influence the access to OT services, including OT sleep services, for children who cannot access occupational therapy services in the private sector (Ned, Tiwari, & Buchanan., 2020).

### **5.3 The awareness of sleep interventions provided by occupational therapists working with children in South Africa**

The respondents in this study reported on their regular caseload. They reported to see children mostly between the ages of four and six (35.71%) (figure 4.3) with the majority indicating to provide interventions for Learning disabilities (27.65%), Sensory based dysfunctions (27.65%), Neurological disorders (23.23%), Developmental delay (18.62%) (see Figure 4.3).

Literature by Howard (2002) indicates similar findings in that most children are presented to occupational therapy between the ages of 3 and 10, and majority during the school-going age. It is the researcher's experience that majority of the children presenting to occupational therapy during this stage do so mainly due to educational difficulties and that interventions are tailor-made to address such difficulties. According to the Gauteng Provincial Government approach to disability rights (2010), there is fragmentation of services such as a tendency to work in silos even within departments. This was further highlighted by Barnes et al., (2003) who showed the American public's perception



regarding school-based occupational therapists. They perceived that school-based occupational therapists could not provide effective interventions because they perceived a lack of awareness regarding education unrelated conditions. If occupational therapists work in silos, they are likely to miss sleep disorders amongst the children they provide interventions to even if sleep disorders may be the root cause of the presenting difficulties.

The results of this study revealed that occupational therapists who participated in this study were not aware of the sleep disorders amongst the children within their caseload. Only one respondent reported that sleep disorders were a part of their caseload with most respondents listing learning disabilities (30,64%), sensory based dysfunctions (30,64%), neurological disorders (21,69%) and developmental delay (17,38%) as prominent diagnoses (Figure 4.3). Although respondents did not link sleep disorders to the conditions above, it is important to note that these conditions have been associated with sleep disorders in children (Meltzer & Mindell, 2014; Charleson, 2014). Literature indicates that sleep disorders could be a root cause for learning disabilities. According to (Biggs, 2010) and from Ned, Tiwari, & Buchanan (2020) occupational therapists in both the public and private sector in South Africa do not work exclusively on sleep disorder but rather on sleep with reference to other medical conditions. As such, disordered sleep may not readily be considered as a main diagnosis. The implications of this could be a lack of occupational therapy sleep intervention as occupational therapists do not consider sleep disorders.

The prevalence of sleep disorders in the general paediatric population is estimated to be in the range of 20% (Brown, Swedlove & Berry, 2012) and there is clear evidence that this percentage increases in children with chronic health conditions and neurodevelopmental disorders (Goodlin-Jones, Sitnick & Tang, 2008; Malow, Adkins & Reynolds., 2014). This is reflective in the results of this study where 22% of respondents stated 20-29% of their paediatric clients had disordered sleep (Figure 4.7).

The conservative estimate of sleep disorders is not surprising as these types of problems are difficult to determine. Children are seldom able to clearly express their sleep experiences, and both children and their caregivers may have little insight into the relationship between sleep disorders and poor daytime functioning. A child's method of expression and coping are also strongly influenced by family and social forces (Hoffman, et al., 2008). A family may have adapted to a child's disordered sleep (albeit with

dysfunctional coping strategies such as no set-bed time routine and/or allowing the child to co-sleep) to the point that they no longer view the sleep disorder as a problem. However, non-restorative sleep has a cumulative negative socio-cognitive and biological impact (Krakowiak, et al., 2008; Moturi & Avis, 2010). Unfortunately, if the family unit does not convey concerns in sleep and occupational therapists are not aware of the link between sleep disorders and poor daytime functioning. As a result, occupational therapists may not view sleep disorders as a concern and are thus unlikely to conduct necessary assessments for sleep disorders in children.

Surprisingly, in this study, 15% of respondents indicated that 30-39% of their caseload had disordered sleep whilst 12.5% of respondents indicated that 40-49% of their caseload had disordered sleep (Figure 4.7). Although a paucity of national literature regarding sleep disorders in children exists, the prevalence of sleep disorders amongst children is well-documented in developed countries. An example of this is the study by Bruni and Novelli (2010), highlighting that 86% of children aged 0 to 6; 81% of children aged 6 to 11, and 77% of children aged 11 to 16 suffer from a sleep disorder.

### **5.3.1 The awareness of occupational therapy assessment methods and tools for sleep disorders in children**

Similar to the lack of awareness regarding sleep disorders in children, a lack of awareness regarding assessment tools to assess sleep disorders in children was noted in the results of this study. Most respondents (72.81%) relied on information from the 'history taking and background information forms' (Figure 4.5). The respondents expanded on their answers by listing question items which could be put into the history taking and background information forms, such as:

- Sleep habits (snoring with pauses or gasps, heavy breathing, unusual positioning, behaviour problems, sleep walking);
- Sleep routine (night settling, regular nightmares or terrors, consistency);
- Sleep pattern (sleep hours per night, consistency in sleep hours, nap times for appropriate ages, trouble with sleeping, waking nightly); and
- Impact on daytime function (concentration difficulties; play difficulties).

Most respondents (77.98%) also relied on caregiver reporting as an assessment method in identifying a sleep disorder in a child (Figure 4.4). This could be associated with the

fact that most of the children on the respondents' caseload were mainly between the ages of four and six, thus the parents are considered the most reliable source. However, by placing the responsibility on the caregivers to identify and assess for a sleep disorder, many children with sleep disorders may be overlooked. Without clear measurable indicators for parents to recognise and record the signs of a sleep disorder, the reliability of parental reporting and the use of background information forms is likely to be sub-optimal. Similar findings were found in literature by Prathanee (2012) who considered the reliability of parental reporting compared to a standardized Thai speech and language test. Prathanee (2012) found that the reliability of parental reporting was moderate whilst that of the standardized Thai speech and language test was excellent.

Similarly, the research in New Zealand by Brown, Swedlove & Berry (2012) highlights a high reliance on caregiver reports to identify sleep disorders, rather than by professional observation or assessment. This therefore suggests that the limited use of reliable assessment methods to identify sleep disorders amongst children is not only a national problem but the international struggle as well, as there is poor awareness and limited resources available to accommodate these children. These challenges are further amplified in contexts such as South Africa, where a resource gap exists in the public health sector (Ned, Tiwari, & Buchanan 2020). In this study, the estimate of sleep disorders (figure 4.7) coupled with the high reliance on parental report as opposed to observation, and functional and standardised assessment for sleep problems (figure 4.4), indicates that some children with sleep disorders may not be identified and this poses a risk on the child's development as without detection these conditions remain untreated.

Although much evidence shows that sleep disorders are frequent and to be expected in children with a range of chronic neurodevelopmental, musculoskeletal, and mental health conditions, it appears possible from the responses that occupational therapists working with children rarely consider assessments for sleep disorders (Bruni & Novelli, 2010). As a consequence, the occupational therapy sleep interventions may not be provided as assessments for sleep disorders were not carried out.

### **5.3.2 The awareness of occupational therapy intervention methods for sleep disorders in children**

A few respondents (31.58%) indicated lack of awareness regarding occupational

therapy interventions that could be used to address sleep disorders in children (figure 4.6). Others indicated having a limited role in the management of these conditions and considered referrals to other professions as an effective way of managing sleep disorders in children (20.17%) (figure 4.6). The results are not surprising as without the awareness or use of occupational therapy sleep assessments, the need for occupational therapy sleep interventions is negated.

Most respondents still considered sensory diets/home programs (56.14%) and sensory integration principles and techniques as an intervention option for sleep disorders (21.92%) (Figure 4.6). This could be because sensory integration has shown positive results with regards to participation in various occupations in children (Davis, et al., 2004; Bruni & Novelli, 2010; Rogers, et al., 2017).

The preference of sensory integration therapy in the management of sleep disorders in children is not surprising as this form of intervention is specific to occupational therapy in South Africa. Therefore, occupational therapists are uniquely suited to provide this type of intervention (SAISI, South African institute of Sensory Integration, 2020). Internationally, addressing sensory avoiding/seeking behaviour by increasing or decreasing the amount of sensory input has, furthermore, been found to result in improved sleep participation (Wiggs & Stores, 2004; Luginbuehl & Kohler, 2009; Moturi & Avis, 2010; Jorge, et al., 2013; Iwama, et al., 2015; Rogers, et al., 2017). However, with a decreased awareness regarding sleep disorders, a research-to-practice gap is highlighted.

#### **5.4 The provision of sleep interventions by occupational therapists working with children in South Africa**

The results showed that few respondents provided sleep interventions for children with sleep disorders (Figure 4.1). Only 41.43% (n=38) of the occupational therapists working in the private sector were identified to provide sleep interventions, and only 10.53% (n=2) of the occupational therapists working in the public sector reported to provide sleep interventions (Figure 4.1).

This displays that there may be a gap in the number of occupational therapists providing OT sleep intervention to children with sleep disorders. The low number of occupational therapists providing sleep interventions in South Africa is similar to international

literature by Brown (2012) who records a poor rate of occupational therapists working with sleep disorders.

Internationally, the low number of occupational therapists working with sleep disorders can be accounted to the consideration that sleep medicine is a specialist area (O'Connell, 2009). However as revealed in the results of this study, that may not be true for a developing country such as South Africa. The results show that in a developing country such as South Africa, inexperienced junior occupational therapists may be required to provide sleep interventions to children with sleep disorders and this may be associated with the human resource disparities (table 4.1). As evident in this study, of the respondents had less than five years of experience (26.32%) and/or had only received a bachelor's degree in occupational therapy (89.47%) (Table 4.1).

The results also highlighted the disparities in the provision of occupational therapy sleep interventions between the public (10.53%) and private (41.43%) sector (figure 4.1). Hypothetically paediatric patients with sleep disorders seen in the public sector may be missed due to the covert nature of this type of disorder. The sheer number of other overt impairments associated with the burden of disease (including maternal and child health, HIV and TB, spinal cord injury, traumatic brain injury, amputation, orthopaedic complications, mental illnesses, and other non-communicable diseases) may overshadow the need to address a sleep disorder (Ned, Tiwari, & Buchanan., 2020).

However, the provision of sleep interventions for children with sleep disorders remains low in both healthcare sectors. The results of this study displayed a poor awareness of sleep disorders in children, and this could be a possible reason. Although sleep disorders are linked to delays in all areas of development, a poor awareness of sleep disorders would impair the assessment and treatment of sleep disorders.

The years of experience which occupational therapists who provide services to children have can also be a reason for the poor awareness regarding sleep disorders in children (figure 4.1 and table 4.1.). With the limited expertise, there is likely to be poor supervision or carry-over of skills between occupational therapists, thus leading to a lack of provision of occupational therapy sleep interventions in children. For occupational therapists to grow, they require supervision during the first few years of their career. However, with the lack of human resources, entry level occupational therapists could be without supervision and training (Eager, 2017; Ned, et al., 2020).

If occupational therapists have poor supervision and/or a lack of awareness regarding sleep disorders in children, they could provide inadequate or no care for the children with sleep disorders. The results of this study show that the majority of respondents do not provide interventions for sleep disorders (64.91%) (figure 4.1). The results further highlight that of the respondents who provide services to children, the majority have less than 5 years' experience (26.32%) and/or have only a bachelors' degree in occupational therapy (89.47%) (figure 4.1). The results further indicate that only ten participants (8.77%) received training regarding sleep and sleep disorders in their undergraduate degree (figure 4.14). These results highlight the lack of experience, a lack of training and a lack of awareness of sleep disorders and occupational therapy sleep interventions. This results in a lack of OT sleep assessments and OT sleep interventions for the occupational performance domain of sleep.

#### **5.4.1 The occupational therapy assessment methods and tools for sleep disorders in children**

More than two thirds of respondents (78.07%) did not assess for sleep disorders in their paediatric clients (Figure 4.8). Although sleep is recognised as an occupational performance domain (American Occupational Therapy Association, 2020), the lack of awareness regarding sleep disorders in children may be reason for the poor assessment rate.

Few respondents (3.51%) reported to be aware of standardised assessment tools (figure 4.8), while most respondents (15.79%) that work(ed) with children used non-standardised assessments (figure 4.8). This data is congruent with the results of the study by Mbuyi (2016) which highlighted that in developing countries such as SA, standardised tests are at times inaccessible to occupational therapists, due decreased financial resources and other barriers. As a result, observation is commonly used for assessment (Mbuyi., 2016).

The respondents identified the following standardized tests which could be used to assess for sleep disorders in children, namely, the Child Sensory Profile 2 (Dunn, 2014), Sensory Integration Assessment (Ayres, 1996), Tomatis Listening Test System (Tomatis, 1996), and CBTi: Cognitive Behavioural Therapy for Insomnia (Perlis, et al., 2005) (Figure 4.8).

CBTi: Cognitive Behavioural Therapy for Insomnia was the only sleep-specific assessment identified (Perlis, et al., 2005). This standardised assessment has been shown to be effective in the assessment of sleep disorders in the paediatric population through scientific reviews and meta-analyses. In a Canadian study by Bock (2016), they concluded that 88.9 % of doctors endorsed over-the-counter medications and 66.1 % prescription medications for sleep disorders in children, especially for children with developmental delays (Bock et al., 2016). This highlights the link between sleep disorders and developmental delay, a condition widely treated by occupational therapists (Ned, Tiwari, & Buchanan.,2020). With the general population seeking to decrease their medication intake, CBTi is viewed as an alternative. CBTi is within the occupational therapy scope and therefore can be administered by an occupational therapist. But a lack of awareness regarding this assessment, and other internationally recognised ones, is noted. If occupational therapists are not aware of assessments for sleep disorders, they may not be assessing for these disorders and therefore may not be providing intervention.

The three other standardized assessments listed were the not sleep specific but rather address the conceptual domain of self-efficacy and self-management (Ayres, 1996; Dunn, 2014; Tomatis, 1996). Research by Ho and Siu (2018) on the use of '*The Canadian Occupational Performance Model (COPM)*' to evaluate sleep disorders depict similar results. As with the standardized assessments reported on in this research, COPM has widely been used as an outcome measure to address the conceptual domain of self-efficacy and self-management in a variety of occupational performance domains including sleep (Ho & Siu, 2018). A possible reason could include the holistic approach used by occupational therapists when treating clients. Occupational therapists focus on occupational performance in the occupational performance domains rather than specifically on one domain such as sleep.

Internationally, specific sleep evaluations such as the BEARS Sleep questionnaire (Spruyt & Gozal, 2011), the Brief Infant Sleep Questionnaire (BISQ) (Sadeh, 2004), and The Children's Sleep Habits Questionnaire (CSHQ) (Owens, et al., 2000) are also utilised with the child with sleep disorders in countries such as the United States of America and Canada (Brown, et al., 2012). Sleep specific evaluations are important as they provide measurable goals and intervention plans. Without sleep specific

evaluations, the occupational therapy sleep interventions may not be specific to the root difficulty and as such the interventions may not be effective.

Unfortunately, no information could be found on the BEARS Sleep Questionnaire, The BISQ, and The CSHQ being offered as part of training courses in SA. This could be reason for the limited number of respondents providing these assessments. If these assessments, and others like it, are not taught within the undergraduate, postgraduate and/or other courses in SA, occupational therapists may not have sufficient knowledge to implement them in practice.

#### **5.4.2 The occupational therapy interventions for sleep disorders in children**

About a third of the respondents (35.09%) provide occupational therapy interventions for sleep disorders in children (Figure 4.1). However, less than half of the respondents (39.02%) reported to be a primary therapist for the child (Figure 4.9). The sensory integration interventions or cognitive behavioural interventions were identified to be the most frequently used interventions by the primary therapists (Figure 4.10).

Sensory integration interventions for sensitivities to various sensory stimuli have shown positive outcomes for children with sleep disorders (Davis, et al., 2004; Bruni & Novelli, 2010; Rogers, et al., 2017). Occupational therapists working with paediatrics provide a variety of sensory integration strategies such as Matsugova's MNRI tactile integration massage and Tomatis therapy to improve the sensory processing abilities of the child, and thus improve the sleep quality and quantity. Unfortunately, referrals to OT appear to be low in South Africa (Jorge, et al., 2013). As such, sensory integration interventions may not be provided to infants and children, even though their ability to fall and/or stay asleep is reported to be influenced by sensory modulation difficulties related to auditory, vestibular, and tactile processing.

Cognitive behavioural strategies/behavioural modification, has also been widely researched, and positive results have been identified for typical and atypical developing children, if the parents are involved in implementation and a strict routine is followed (Meltzer & Mindell, 2014; Hiscock, et al., 2015; Papadopoulos, et al., 2015; Corkum, et al., 2016). For a child with a sleep disorder, this would require extensive parental involvement for cognitive behavioural strategies to work. Cognitive behavioural therapy



can be used to treat the functional implications of sleep disorders in the affected children and their caregivers (Bruni & Novelli, 2010; Rogers, et al., 2017).

Other sleep interventions provided by occupational therapists could be utilised both within sensory integration and cognitive behavioural strategies (Figure 4.10). For example, Environmental modifications for the sleep environment could be based in the sensory integration model or the cognitive behavioural model depending on the principles utilised. If the goal were to change cognitive misrepresentations and behaviours, a cognitive behavioural approach would be used with a focus on improving emotional regulation and developing personal coping strategies (Meltzer & Mindell, 2014). Likewise, if the goal were to influence the way in which the child responds to sensation, reducing distress, and improving motor skills and adaptive responses; this would fall into a more sensory integrative approach (Ayres, 1996). Unfortunately, only a handful of therapists provide these and this could be associated with the poor awareness regarding sleep and sleep interventions (O'Connell, 2009).

One role which occupational therapists take on, is the role of an educator. Overall, respondents indicated spending more time on sleep education with the caregiver (47,76%) than the child (19,77%) (Figure 4.11). Some therapists qualified their comments and stated that in the school setting occupational therapists did not address the occupational performance domain of sleep and focused solely on education and/or play. This is similar to the literature Barnes et al., (2003) which reflected on the perception that school-based occupational therapists could not provide effective interventions because they perceived a lack of knowledge regarding education unrelated conditions.

Given the inextricable and foundational influence sleep has on cognition and daytime behaviour and functioning, it is likely that school performance and response to therapeutic activities would be positively impacted by addressing sleep management as key components of any school-based program (O'Connell, 2009).

However, perceived barriers with regards to the provision of sleep interventions for sleep disorders in children persist. Poverty of education (50,85%), assessment tools (46,61%) and intervention tools (44,06%), the child's physical or cognitive disability, poor prioritization, interest, time, and carry-over were identified as main barriers (Figure 4.13). The results show that need exists for standardised assessment tools, treatment tools

and education material (36,44%), and better public/professional awareness of the significant impact of sleep disorders on a child's function, learning, and development.

This gap is not unique to OT; overall, the general public and healthcare providers' understanding of the implications of ongoing disordered sleep, is poor and therefore more education is needed throughout the healthcare system (Luginbuehl & Kohler, 2009; O'Connell, 2009).

## **5.5 The training received by occupational therapists in South Africa regarding sleep interventions for children**

Most of the respondents had a bachelor's degree in occupational therapy. The "*World Federation of Occupational Therapists Minimum Standards for the Education of Occupational Therapists*" published in 2016 states that graduates are considered qualified when they are awarded a bachelor's or equivalent degree (World Federation of Occupational Therapists., 2016). As a result, if occupational therapists are not provided with education regarding sleep disorders in children and possible occupational sleep interventions in their undergraduate degree, they may not be aware that these sleep disorders exist.

Of the respondents that provide services to children, 80.7% received no training related to the occupational performance area of sleep and/or sleep interventions for children (Figure 4.14). This could be a reason for the low level of awareness regarding sleep disorders in children and the low level of awareness and use of occupational therapy sleep interventions which could be provided to address sleep disorders in children.

The results also show that of the respondents who provide occupational therapy sleep interventions, only ten respondents (8.77%) received training in their undergraduate degree regarding sleep and sleep disorders in children (figure 4.14). Of the nine respondents who studied further towards a master's degree in occupational therapy, two (22.22%) received training on sleep and sleep disorders in children (figure 4.14). This could indicate that theory regarding sleep and sleep interventions for the child is offered to a limited extent at universities in SA, and that a limited number of occupational therapists obtained sleep and sleep interventions specific knowledge through undergraduate or postgraduate training.

This indicates that occupational therapists with minimal to no training on the occupational performance domain of sleep and sleep interventions, at both an undergraduate and postgraduate level provide occupational therapy sleep interventions to children with sleep disorders. This could result in feelings of incompetence in occupational therapists who provide these services. This is congruent with the research from Ned et al., (2020) who highlighted the feelings of poor competence amongst junior occupational therapists in public health sector. The feelings of incompetence can further exacerbate the gaps in service delivery of occupational therapy sleep interventions.

On an international level, it is recommended that entry level occupational therapists should be trained to provide effective services to children with sleep disorders (O'Connell, 2009). From the results of this study, it is clear that entry-level occupational therapists are providing sleep interventions for children in South Africa are without the necessary training (figure 4.14). This could be attributed to a lack of seasoned staff who, as Eager (2017) and Ned (2020) suppose, leave the country before the age of 35.

In SA, the role of the occupational therapist in caring for children with sleep disorders is not well-defined. This results in challenges when aiming to include this knowledge in the undergraduate occupational therapy curriculum. Nevertheless, the need for occupational therapy sleep interventions seems desperate when taking the statistics on sleep disorders in children and the functional implications arising from lack of early detection and intervention into account (Tucker & Fishbein, 2009; Waters, et al., 2013; Chawla & Heussler, 2016). According to Carter, et al., (2014), up to 50% of children will present with a sleep disorder. Considering the potential debilitating long term needs of these children, this cannot be ignored. As can be seen from international literature by Burke (2004), Fung (2013), Charleson (2014) and Gruber (2016), occupational therapists can provide invaluable services to these vulnerable children and their families, but they require the necessary information and training to do so.

Another limitation affecting the integration of sleep and sleep interventions in undergraduate training, is attributed the fact that this area is considered a specialist field and most undergraduate curriculums are focused on creating generalist occupational therapists (South African Qualifications Authority (SAQA), 2020). To strengthen this, 50.58% of respondents in this study identified insufficient training and/or that financial constraints to accessing training as main barriers affecting their ability to effectively treat children with sleep disorders (Figure 4.14). Thus, more education on all

levels and research was suggested as possible supports to providing sleep intervention to children in the future. Occupational therapy training institutions need to address the research-to-practice gap by ensuring alignment of training to the needs at the practice level.

Curriculum planning, revision and development are part of an ongoing process which all departments at tertiary institutions are confronted with daily. Political, cultural, economic, and technical changes influence health delivery. Occupational Therapy concepts and curriculum continues to expand and develop, and this can cause discrepancies between what is provided in the undergraduate curriculum versus the knowledge base developed through research. Cartor stated that the rate of change taking place in the health care field now is unprecedented and this can also result in a research to practice gap. Educational change further depends on what educators and clinicians do and think and how they act, thus if Sleep and Rest is not considered in the same context as the other occupational performance domains, change will be slow to occur.

A viable option to address the gap in training could include Continuing Professional Development (CPD). All healthcare professionals, national and international, are required to complete CPD courses (Health Practitioners Council of South Africa, 2017). CPD is defined as continuing education for healthcare professionals through attending learning activities and events, specific to one's scope of practice, to ensure that they remain up to date in their knowledge and skills (Health and Care Professions Council, 2015). Occupational therapists maintain CPD by engaging in formal education, or extra training courses (Health and Care Professions Council, 2015).

Examples of the platforms which provides access to CPD courses are Professional Minds (2017) and Impact Learning (2020). They offer training courses to healthcare professionals in South Africa, developed according to WHO guidelines, have CPD accreditation, and are offered in collaboration with OTASA.

An example of a CPD course, called '*Understanding Sleep*', is specifically related to skills and insight regarding the child and sleep disorders (Thamm & Weir-Smith., 2015). Through this course, healthcare professionals (including occupational therapists) were trained to treat children with sleep disorders holistically, with a focus on the family. The training was focused on sleep hygiene and cognitive behavioural therapeutic strategies which enhance the child's development, emotional and social behaviour, sleep routines

and sleep positioning, caregivers' handling techniques, and supporting the parents of the child with sleep disorders (Impact Learning., 2020). At the time of the study, no other platforms with sleep related courses within South Africa were found by the researcher.

Unfortunately, the cost to attend such courses can start at R1 500 per person (Occupational Therapy Association of South Africa, 2018). Literature indicates that CPD education and training must be cost-effective, accessible, applicable, and appealing (Smith, 2005; Gill, 2007). One of the most successful methods of providing education to health care professionals is through an electronic source (Smith, 2005; Gill, 2007). Computer-based learning is favoured by healthcare providers, and is seen as enjoyable, easy to use, efficient, and cost-effective (Smith, 2005; Gill, 2007). Therefore, access to online courses regarding sleep interventions for the occupational therapist should be prioritised.

## **5.6 Conclusion**

In conclusion, the findings demonstrate that there is a research-to-practice gap within occupational therapy regarding:

- the awareness that sleep disorders are prevalent in children with other health conditions;
- provision of the assessment tools to determine if disordered sleep may be present;
- the knowledge of effective interventions; and
- the assessment tools to determine the outcome of the interventions and education for the child and caregivers.

Disordered sleep is a fundamental barrier to physical, socio-emotional, and cognitive functioning, and all aspects of well-being. Thus, interventions for other functional goals offered before sleep management is achieved, may result in sub-optimal outcomes. Unfortunately, it is likely that most Occupational Therapy entry-level curricula and other knowledge translation and dissemination activities for a post-degree qualification have not yet caught up to address this need. Also, OT research for assessment tools and interventions in these areas is scattered and sparse indicating a need for focused clinical study. Assessment is currently highly dependent on parental report, but without clear guidelines and training, parents cannot necessarily assume this role. Therefore,

an increased awareness of assessment tools, and the development of new ones, is evident.

Although medical research for the negative functional consequences of disordered sleep is strong, it is only just starting to emerge in the rehabilitation literature. As such, it is perhaps not surprising that a gap has developed between the evidence-base and clinical practice. Nevertheless, occupational therapists are open to learning and gaining the new skills required. The respondents in this study requested more education on sleep to be incorporated in their undergraduate and postgraduate training. This includes children's disordered sleep in the entry level curriculum that will also help address the perceived lack of resources, scope of practice questions, and ability to respond to other team members' lack of awareness.

## **CHAPTER 6. CONCLUSION AND RECOMMENDATIONS**

### **6.1 Introduction**

The objectives of this study were to determine the level of training occupational therapists in South Africa (SA) have with regards to the performance domain of sleep and/or sleep interventions; the awareness occupational therapists have regarding sleep disorders in children; and the type of interventions that the occupational therapist provides to children with sleep disorders in South Africa. The limitations of the study, future recommendations and evaluation of the study is presented in this chapter, followed by the final conclusion of the research report.

### **6.2 The limitations of the study**

The limitations included decreased access to the complete population of occupational therapists in SA. Convenience sampling was used to collect the sample through OTASA, RuReSA and SAISI (Kielhofner, 2006). But through this method, the full population of occupational therapists practicing in SA could not participate in this research if they had not been registered on OTASA, RuReSA and SAISI. As such, sampling bias could have occurred. Although occupational therapists were asked to send the email on to those who were not registered on the online platforms, this still did not reach all occupational therapists due to time constraints and inaccessibility to email addresses. Furthermore, not all therapists responded to each question, so conclusions were based on less than complete data. The length of the survey may have further placed a high response burden that reduced the detail of some responses; and the lack of human interaction meant that respondents could misinterpret questions. Due to the closed nature of the majority of the questions, respondents did not have the opportunity to ask for clarification of the questions if they did not fully understand them. Lastly, respondents had only six weeks to access and complete the mailed survey. This is an extremely short period as literature shows that it usually takes 3 to 4 months for respondents to access, complete and submit questionnaires from mailed surveys (Kielhofner, 2006).

### **6.3 Recommendations**

Basic theory and knowledge concerning the occupational performance domain of sleep and sleep interventions should be included in undergraduate OT courses in South Africa. Curriculum which is fluid and dynamic needs to be developed to ensure new information, such as occupational therapy sleep interventions, can be enforced as and when they come about. If the focus of occupational therapy continues to lean towards the occupational performance domains rather than the occupational client factors and performance skills, this is viable.

A need for standardised assessment tools, treatment tools and education material is identified, as well as a need for better public/professional awareness of the significant impact of sleep disorders on a child's function, learning, and development. Research which is focused on clarifying the role of OT in sleep interventions for children with sleep disorders is also recommended.

In clinical practice, as practitioners are required to receive continuous professional development, courses should shift focus to occupational performance domains over different conditions, occupational client factors and performance skills.

It is also recommended that, should this study be repeated or elaborated on, a variety of different platforms be used for sending out surveys, to improve the return rate of surveys.

The researcher also includes the strengths of this study so that they may be utilised if this research is to be repeated. The strengths of this research included the use of a pre-existing survey, which made piloting easier and increased the validity of the study; the cost-effectiveness of the study because of the respondents were found through online platforms.

### **6.4 Evaluation of the study**

This study used a quantitative, descriptive, cross-sectional study design. This was an appropriate study design for the study as it allowed the researcher access to larger population base. The use of a survey was also beneficial as it could be emailed out via online platforms which meant that the researcher could access respondents' cross-country, resulting in a more inclusive sample. The three online platforms chosen were chosen based on their convenience in reaching occupational therapists in South Africa.



Unfortunately, the use of only three online surveys also resulted in few responses. Although the estimated sample size was met, the number of respondents still appears small due to the number of occupational therapists that the researcher had access to. The researcher would have liked to have used a variety of different online platforms to improve the response rate.

Using an already existing questionnaire, '*The Occupational Therapy Health Literacy Skills for Pain and/or Sleep Disorder Survey*' developed by Brown, Swedlove and Berry (2012), further increased the convenience for the researcher as they did not need to create a specific questionnaire. But the challenge in using an existing questionnaire was that of the questions were not relevant and the researcher spent much of their time sifting through the questions to ensure they were relevant to the South African occupational therapists' population.

The use of the quantitative survey design also limited the respondents in their responses. A mixed method design including qualitative data could have provided additional information regarding trends and changes in participants' interpretation of the questions. Interpreting the results of this study was a rewarding process as rich evidence emerged which could be used to assert the importance of occupational therapy within the occupational performance domain of sleep. This study thus adds valuable new evidence.

## **6.5 Conclusion**

From the data, disparities between the number of practitioners working with children in the public and private sectors was noted. Often, new graduates are placed in the public sector for their community service year where they are required to work with children with a variety of conditions. The results of this study showed that these graduates have limited to no knowledge of the occupational performance area of sleep, or how it can impact on occupational performance in other occupational performance areas. As such, the administration of occupational therapist sleep interventions was found to be poor in both sectors. This is consistent with the international literature which records a lack of occupational therapists working with sleep disorders (O'Connell, 2009).

This study further highlighted the fact that many occupational therapists are not aware of the evidence-base that highlights the frequency of disordered sleep in children with neuro-developmental and other health conditions. As such, while learning disabilities,

sensory based dysfunctions, neurological disorders, and developmental delay were reported as common occurrences, few therapists assessed for disordered sleep. A high reliance is rather placed on the parent to report signs of disordered sleep as is compatible with the literature (Brown, Swedlove & Berry, 2012). This is not appropriate as caregivers may not have the necessary tools and awareness to evaluate the child's disordered sleep. Thus, some children are at risk of their disordered sleep going undetected and untreated.

Those that do, provide interventions from a sensory integrative or a cognitive behavioural frame of reference. A general lack of awareness regarding standardised assessments for initial and re-evaluation of disordered sleep in the child exists. Internationally recognised sleep assessments, for the child, such as the BEARS Sleep Questionnaire, The Brief Infant Sleep Questionnaire (BISQ), and The Children's Sleep Habits Questionnaire (CSHQ) remain unknown within the South African setting. As such, most of the respondents used non-specific assessments to assess and treat sleep disorders as a part of a holistic approach.

One possible reason for the lack of occupational therapy standardized assessments for sleep disorders is that, until recently, OT was considered as a rehabilitative function. Occupational therapists were solely involved on a consultation basis, and the occupation-based evaluations were only completed on referral of physicians. Occupational therapists continue to work on a consultation basis in the occupational performance area of sleep; however, they are stepping more and more into the role of the primary therapist. Much work still needs to be done to enhance this role.

This study established that training and knowledge of occupational therapists to effectively take on this role is insufficient on an undergraduate level. Most respondents had not received training in this field of practice, despite sleep being recognised as an occupational performance domain. Furthermore, most respondents who are providing sleep interventions were younger and inexperienced; as such they may not fully grasp an understanding of sleep and the interventions for disordered sleep. CPD courses on the occupational performance area of sleep and sleep interventions are therefore advisable for all occupational therapists working in the paediatric field in South Africa.

## CHAPTER 7. References

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## Appendix A: The Occupational Therapy Health Literacy Skills for Pain and/or Sleep Disorders Survey



### Occupational Therapy Health Literacy Skills for Pain and/or Sleep Disorders Survey

Thank you for participating in the survey- please answer in relation to your current position.

Please tick if you are currently not practicing\_\_\_\_\_

(If so, please stop here. Thank you for your time. Please return the survey in the enclosed envelope)

If you are practicing as an occupational therapist provide the following information

Question 1- Background (please put an 'X' beside your answer)

- Highest degree:    \_\_\_ Bachelor                      \_\_\_ Masters  
                             \_\_\_ PhD
- Area(s) of Practice: \_\_\_ Pediatric                      \_\_\_ Adult Orthopedic/Plastics  
                                         \_\_\_ Adult Neurology                      \_\_\_ Geriatric  
                                         \_\_\_ Adult Medicine/Cardiac
- Gender:    \_\_\_ Female                      \_\_\_ Male

Question 2 – Caseload (please list)

What three diagnoses are the most common for the children on your caseload?

1. \_\_\_\_\_
2. \_\_\_\_\_
3. \_\_\_\_\_

Question 3 – Sleep disorders (please write in the percentage of your total client/patient group that you know, or believe, to have sleep disorders)

- \_\_\_\_\_ %

Question 4- Sleep disorder interventions (please write in a short answer to the following questions)

i. In general, how would you know if a child who is your patient has a sleep disorder?  
(For example – *it is noted on the referral form; I see it from the medical record; I ask the patient, etc*)

|                                                                                                                                                                                                                                                                               |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                                                                                                                                                                                                                                                               |
| <p>ii. What signs would suggest to you that a child who is your patient has a sleep disorder if this diagnosis was not part of the medical history that was provided to you?</p>                                                                                              |
| <p>iii. How would you determine if a child who is your patient had a sleep disorder?</p>                                                                                                                                                                                      |
| <p>iv. Do you use an assessment tool to determine if there is a sleep disorder?</p> <p>If yes, is it a standardized assessment or one that was created in-house?</p>                                                                                                          |
| <p>v. If you use a standardized assessment tool, please tell us which one.</p>                                                                                                                                                                                                |
| <p>vi. Once you have identified, or been informed, that a child who is your patient has a sleep disorder, what interventions would you provide? (Please list and identify which items are standardized interventions and which ones have been developed in-house).</p>        |
| <p>vii. What percentage of your total interventions with pediatric clients who have sleep disorders involves teaching the child new information about sleep or techniques for managing a sleep disorder? _____%</p> <p>What percent involves teaching the parents? _____%</p> |
| <p>viii. How do you determine if your teaching about sleep disorders is effective?</p>                                                                                                                                                                                        |
| <p>ix. On average, how effective do you think your teaching of new information about sleep and sleep management techniques to children with sleep disorders has been? (please state a percentage) _____%</p>                                                                  |

|                                                                                                                                                                                                                                                           |                                                                                               |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------|
| How effective do you think your teaching is with parents? _____ %                                                                                                                                                                                         |                                                                                               |
| <b>Question 5- Barriers</b> (From the following list, please place an "X" beside the <b>three</b> items that you believe are the greatest barriers to effective teaching about sleep disorders & managing sleep disorders for children and their parents) |                                                                                               |
| <input type="checkbox"/>                                                                                                                                                                                                                                  | A. There are no assessment tools to determine the problem exists                              |
| <input type="checkbox"/>                                                                                                                                                                                                                                  | B. We lack teaching materials to use with children and their parents                          |
| <input type="checkbox"/>                                                                                                                                                                                                                                  | C. I have insufficient training in how to effectively teach children and their parents        |
| <input type="checkbox"/>                                                                                                                                                                                                                                  | D. I lack time to teach children and their parents about sleep disorders and sleep management |
| <input type="checkbox"/>                                                                                                                                                                                                                                  | E. I do not feel this is a priority area in my practice                                       |
| <input type="checkbox"/>                                                                                                                                                                                                                                  | F. My co-workers do not feel this is a priority role for occupational therapy                 |
| <input type="checkbox"/>                                                                                                                                                                                                                                  | G. Children are not interested in learning more about their sleep disorder                    |
| <input type="checkbox"/>                                                                                                                                                                                                                                  | H. Parents are not interested in learning more about their child's sleep disorder             |
| <input type="checkbox"/>                                                                                                                                                                                                                                  | I. The child's physical condition                                                             |
| <input type="checkbox"/>                                                                                                                                                                                                                                  | J. The child's cognitive condition                                                            |
| <input type="checkbox"/>                                                                                                                                                                                                                                  | K. Other? Please write in-                                                                    |

**Question 6 – Supporting practice** (Please write in any comments about what you think would help you to deliver more effective health education for a child who is your patient with a sleep disorder)

**Question 7 –Chronic Pain** (Please write in the percentage of your total pediatric client/patient group that you know, or believe, to have chronic pain)

• \_\_\_\_\_ %

**Question 8- Chronic Pain Interventions** (Please write in a short answer to the following questions)

i. In general, how would you know if a child who is your patient has chronic pain? (for example – *it is noted on the referral form; I see it from the medical record; I ask the patient, etc*)

|                                                                                                                                                                                                                                                                    |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                                                                                                                                                                                                                                                    |
| <p>ii. What signs would suggest to you that a child who is your patient has chronic pain if this diagnosis was not part of the medical history that was provided to you?</p>                                                                                       |
| <p>iii. How would you determine if a child who is your patient had chronic pain?</p>                                                                                                                                                                               |
| <p>iv. Do you have assessment tools to determine if there is chronic pain?</p> <p>If yes, is this a standardized assessment or one that was created in-house?</p>                                                                                                  |
| <p>v. If you use a standardized assessment tool, please tell us which one.</p>                                                                                                                                                                                     |
| <p>vi. Once you have identified, or been informed, that a child who is your patient has chronic pain, what interventions would you provide? (Please list and identify which items are standardized interventions and which ones have been developed in-house).</p> |
| <p>vii. What percentage of your <b>total intervention</b> with a child who have chronic pain involves teaching the client new information about pain or techniques for managing chronic pain? _____%</p> <p>What percent involves teaching the parents? _____%</p> |
| <p>viii. How do you determine if your health teaching about chronic pain is effective with the child?</p>                                                                                                                                                          |

With the parent?

ix. On average, how effective do you think your **teaching** of new information about chronic pain and pain management techniques to children with chronic pain has been? (Please state a percentage)

\_\_\_\_\_ %

How effective do you think your teaching is with parents? \_\_\_\_\_ %

**Question 9- Barriers** (From the following list, please place an "X" beside the **three** items that you believe are the greatest barriers to effective teaching about chronic pain and managing chronic pain)

|                          |                                                                                        |
|--------------------------|----------------------------------------------------------------------------------------|
| <input type="checkbox"/> | A. There are no assessment tools to determine the problem exists                       |
| <input type="checkbox"/> | B. We lack teaching materials to use with children and their parents                   |
| <input type="checkbox"/> | C. I have insufficient training in how to effectively teach children and their parents |
| <input type="checkbox"/> | D. I lack time to teach children and their parents about chronic pain                  |
| <input type="checkbox"/> | E. I do not feel this is a priority area in my practice                                |
| <input type="checkbox"/> | F. My co-workers do not feel this is a priority role for occupational therapy          |
| <input type="checkbox"/> | G. Children are not interested in learning more about their chronic pain               |
| <input type="checkbox"/> | H. Parents are not interested in learning more about their child's chronic pain        |
| <input type="checkbox"/> | I. The child's physical condition                                                      |
| <input type="checkbox"/> | J. The child's cognitive condition                                                     |
| <input type="checkbox"/> | K. Other? Please write in-                                                             |

**Question 10 – Supporting practice** Please write in any comments about what you think would help you to deliver more effective health education for children with chronic pain and their parents.



**Question 11-** Are there any resources for children with chronic pain and their parents that you would recommend for providing patient education and health literacy activities in the areas of chronic pain and/or sleep disorders?

**Question 12-** Anything else you would like to tell us about occupational therapy education and health literacy activities for children with sleep disorders and/or chronic pain and their parents?

Please return the survey within two weeks in the enclosed stamped addressed envelope.

We appreciate your time and input. The findings from this study will produce a report that can help develop curriculum and continuing professional development activities targeted to your identified needs.

**If you would like to receive a list of resources and a final copy of the report** please provide your name and email address here and we will send you the materials at the end of the project.

Name: \_\_\_\_\_

**Appendix B: Permissions letter to use and modify the questionnaire developed by C. Brown (2015)**



**DEPARTMENT OF OCCUPATIONAL THERAPY**  
**FACULTY OF REHABILITATION MEDICINE**

June 1 2018

2-64 Corbett Hall  
Edmonton, Alberta, Canada T6G 2G4  
Tel: 780.492.2499  
Fax: 780.492.4628  
www.ot.ualberta.ca

Dear Alicia Myburgh,

This letter indicates you have my permission to use and modify as needed the questionnaire we developed for :

*Brown, C., Swedlove, F., Berry, R., & Turlapati, L. (2012). Occupational therapists' health literacy interventions for children with disordered sleep and/or pain. New Zealand Journal of Occupational Therapy, 59 (2), 9 – 17."*

Please remember to include acknowledgement to the original source.

Regards

A handwritten signature in black ink, appearing to read "Cary Brown".

Cary Brown, Professor  
Department of Occupational Therapy  
University of Alberta  
Cary.brown@ualberta.ca

## Appendix C: The Occupational therapy interventions for sleep dysfunctions amongst children in South Africa survey

Confidential

Page 1 of 5

### Occupational therapy interventions for sleep dysfunctions amongst children in South Africa

This research project will investigate 'Occupational therapy interventions for sleep dysfunctions amongst children in SA'. The overall aim of this study is to describe current occupational therapy practice with the occupation of sleep in children. Thereby, determining the distribution of sleep services; establishing the type of sleep interventions; and determining the extent of undergraduate and postgraduate training received by occupational therapist offering sleep interventions to children in SA.

The questions require you to tick or write a short answer to each question.

| Demographics of the participant                         |                                                                                                                                                                                                                                                                                                                                      |
|---------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1 Gender                                                | <input type="radio"/> Male<br><input type="radio"/> Female                                                                                                                                                                                                                                                                           |
| 2 Age                                                   | <input type="radio"/> 20 - 30<br><input type="radio"/> 31 - 40<br><input type="radio"/> 41 - 50<br><input type="radio"/> 51 - 60<br><input type="radio"/> 60+                                                                                                                                                                        |
| 3 Which province do you currently work in?              | <input type="radio"/> Northern Cape<br><input type="radio"/> Eastern Cape<br><input type="radio"/> Free State<br><input type="radio"/> Western Cape<br><input type="radio"/> Limpopo<br><input type="radio"/> North West<br><input type="radio"/> KwaZulu-Natal<br><input type="radio"/> Mpumalanga<br><input type="radio"/> Gauteng |
| 4 The health sector in which you are currently working: | <input type="radio"/> Public<br><input type="radio"/> Private                                                                                                                                                                                                                                                                        |
| 5 The type of setting in which you are working:         | <input type="checkbox"/> Hospital<br><input type="checkbox"/> Clinic<br><input type="checkbox"/> School<br><input type="checkbox"/> Private practice<br><input type="checkbox"/> Other                                                                                                                                               |
| Please specify other: _____                             |                                                                                                                                                                                                                                                                                                                                      |
| 6 How many years have you been practicing for:          | <input type="radio"/> ≤ 5<br><input type="radio"/> 6 - 10<br><input type="radio"/> 11 - 15<br><input type="radio"/> 16 - 20<br><input type="radio"/> 21 - 25<br><input type="radio"/> 26 - 30<br><input type="radio"/> 31 - 35<br><input type="radio"/> 36 - 40<br><input type="radio"/> ≥ 41                                        |

- 7 What is the level of qualification(s) you have obtained?
- ☐ Bachelors in Occupational Therapy  
☐ Masters in Occupational Therapy  
☐ Doctorate in Occupational Therapy

What was your specialty?

\_\_\_\_\_

- 8 Where was your place of study:
- ☐ University of the Witwatersrand  
☐ University of Cape Town  
☐ University of Pretoria  
☐ University of KwaZulu-Natal  
☐ University of the Free State  
☐ University of the Western Cape  
☐ Stellenbosch University  
☐ Other

Please specify other:

\_\_\_\_\_

- 9 Did you receive training on sleep interventions in your undergraduate degree?
- ☐ Yes  
☐ No

Please specify what type of training:

\_\_\_\_\_

- 10 Did you receive training on sleep interventions in your postgraduate degree?
- ☐ Yes  
☐ No

Please specify what type of training:

\_\_\_\_\_

- 11 Do/Have you work(ed) with paediatrics clients?
- ☐ Yes  
☐ No

Please indicate which client age groups are most common on your overall caseload?

☐ 0-2 years  
☐ 2-4 years  
☐ 4-6 years  
☐ 7-12 years

What three diagnoses are the most common for the children on your caseload:

\_\_\_\_\_

- 12 Do you offer sleep interventions within your institution?
- ☐ Yes  
☐ No

- 13 Is your role in treating sleep disorders that of a primary therapist (i.e. someone who provides assessments and direct treatment on a regular basis for persons suffering with sleep dysfunctions)?
- ☐ Yes  
☐ No

---

Is your role in treating sleep disorders that of a consultant (i.e. someone who is not regularly involved in the unit, but may be consulted for particular cases or specific problem areas)?

- ☐ Yes  
☐ No

---

Is your role in treating sleep disorders otherwise not specified?

- ☐ Yes  
☐ No

---

Please specify other:

---

Please indicate which of these interventions you offer?

- ☐ Sleep programs for caregivers  
☐ Handling techniques for caregivers  
☐ Environmental interventions  
☐ Developing individualized /developmental care programs  
☐ Sensory integration  
☐ Developmental intervention  
☐ Family support  
☐ Other

---

Please specify other:

---

Please write in the percentage of your total client/patient group that you know, or believe, to have sleep disorders:

- ☐ 0-10  
☐ 11-20  
☐ 21-30  
☐ 31-40  
☐ 41-50  
☐ 51-60  
☐ 61-70  
☐ 71-80  
☐ 81-90  
☐ 91-100

**Sleep disorder interventions (please write in short an answer to the following questions even if you are not currently involved in sleep interventions)**

- 14 In general, how would you know if a child who is your patient has a sleep disorder?  
(For example - It is noted on the referral form; I see it from the medical record; I ask the patient, etc.)
- 
- 15 What signs would suggest to you that a child who is your patient has a sleep disorder if this diagnosis was not part of the medical history that was provided to you?
- 
- 16 How would you determine if a child who is your patient had a sleep disorder?
- 
- 17 Do you use an assessment tool to determine if there is a sleep disorder? If yes, is it a standardized assessment, or one that was created in-house?
- 
- 18 If you use a standardized assessment tool, please tell us which one?
- 
- 19 Once you have identified, or been informed, that a child who is your patient has a sleep disorder, what interventions would you provide? (Please list and identify which items are standardized interventions and which ones have been developed in-house).
- 
- 20 What percentage of your total interventions with paediatric clients whom have sleep disorders involves teaching the child new information about sleep or techniques for managing a sleep disorder?
- ☐ 0-10 ☐ 11-20 ☐ 21-30 ☐ 31-40 ☐ 41-50 ☐ 51-60 ☐ 61-70 ☐ 71-80 ☐ 81-90 ☐ 91-100

- 
21. What percentage of your total interventions with paediatric clients whom have sleep disorders involves teaching the parent or caregiver new information about sleep or techniques for managing a sleep disorder?

☐ 0-10   ☐ 11-20   ☐ 21-30   ☐ 31-40   ☐ 41-50   ☐ 51-60   ☐ 61-70   ☐ 71-80   ☐ 81-90  
☐ 91-100

---

22. How do you determine if your teaching about sleep disorders is effective?

- 
23. On average, how effective do you think your sleep and sleep management techniques to children with sleep disorders has been? (please state a percentage)

☐ 0-10   ☐ 11-20   ☐ 21-30   ☐ 31-40   ☐ 41-50   ☐ 51-60   ☐ 61-70   ☐ 71-80   ☐ 81-90  
☐ 91-100

---

24. On average, how effective do you think your teaching of new information about sleep and sleep management techniques to parents of children with sleep disorders has been? (please state a percentage)

☐ 0-10   ☐ 11-20   ☐ 21-30   ☐ 31-40   ☐ 41-50   ☐ 51-60   ☐ 61-70   ☐ 71-80   ☐ 81-90  
☐ 91-100

---

25. From the following list, please tick the three items that you believe are the greatest barriers to effective teaching about sleep disorders and managing sleep disorders for children and their parents:

- ☐ There are no assessment tools to determine the problem exists  
☐ We lack teaching materials to use with children and their parents  
☐ I have insufficient training in how to effectively teach children and their parents  
☐ I lack time to teach children and their parents about sleep disorders and sleep management  
☐ I do not feel this is a priority area in my practice  
☐ My co-workers do not feel this is a priority role for occupational therapy  
☐ Children are not interested in learning more about their sleep disorder  
☐ Parents are not interested in learning more about their child's sleep disorder  
☐ The child's physical condition  
☐ The child's cognitive condition  
☐ Other
- 

Please specify other:

- 
26. Please write in what you think would help you to deliver more effective sleep interventions for a child with a sleep disorder:

## Appendix D: Human Research Ethics Committee Clearance certificate



R14/49 Ms Alicia Myburgh

### HUMAN RESEARCH ETHICS COMMITTEE (MEDICAL)

#### CLEARANCE CERTIFICATE NO. M181053

**NAME:** Ms Alicia Myburgh  
**(Principal Investigator)**  
**DEPARTMENT:** School of Therapeutic Sciences  
Survey distributed via online of OTASA, SAISI, and RURESA  
**PROJECT TITLE:** Occupational therapy interventions for sleep disorders amongst children in South Africa  
**DATE CONSIDERED:** 26/10/2018  
**DECISION:** Approved unconditionally  
**CONDITIONS:**  
**SUPERVISOR:** Olindah Silaule  
**APPROVED BY:**   
Dr. CB Penny, Chairperson, HREC (Medical)  
**DATE OF APPROVAL:** 16/01/2019

This clearance certificate is valid for 5 years from date of approval. Extension may be applied for.

#### DECLARATION OF INVESTIGATORS

To be completed in duplicate and **ONE COPY** returned to the Research Office Secretary on the Third Floor, Faculty of Health Sciences, Phillip Tobias Building, 29 Princess of Wales Terrace, Parktown, 2193, University of the Witwatersrand. I/we fully understand the conditions under which I am/we are authorized to carry out the above-mentioned research and I/we undertake to ensure compliance with these conditions. Should any departure be contemplated, from the research protocol as approved, I/we undertake to resubmit the application to the Committee. **I agree to submit a yearly progress report.** The date for annual re-certification will be one year after the date of convened meeting where the study was initially reviewed. In this case, the study was initially reviewed in **October** and will therefore be due in the month of **October** each year. Unreported changes to the application may invalidate the clearance given by the HREC (Medical).

Principal Investigator Signature \_\_\_\_\_

Date \_\_\_\_\_



## Appendix E: Permission for the survey to be sent out via OTASA



Alliola Grobler <alliolamyburgh4@gmail.com>

---

### RE: Survey questionnaire to be sent out

2 messages

---

Alliola Myburgh <alliolamyburgh4@gmail.com>  
To: ELHerisa <otooffice@ulweb.co.za>

Thu, Feb 28, 2019 at 10:22 AM

Good day,

**Sleep Intervention survey**

I spoke with you a few weeks back concerning a survey I would like to send out via your platform. Please could you provide me with the invoice for sending out the survey and let me know whether the following email can be sent out:

Good day,

My name is Alliola Myburgh, I am currently doing my masters in occupational therapy at the University of the Witwatersrand. I would like to invite you to take part in a survey concerning OT interventions provided for children with sleep disorders within SA.

The overall aim of this study is to describe current occupational therapy practice with the occupation of sleep in children. Participation is entirely voluntary, and completion of the survey will be assumed as informed consent. The survey will require approximately 10 to 20 minutes of your time in which you will tick or write a short answer to each question.

The information that you provide will be confidential and anonymous as this questionnaire is completed online and therefore, I will not have access to your personal details.

This study has been approved by the Human Research Ethics Committee (Medical) of the University of the Witwatersrand, Johannesburg (M181063).

If you have any questions or queries about the research, please contact:

Contact details of researcher: Alliola Myburgh [alliola.cleymesb@gmail.com](mailto:alliola.cleymesb@gmail.com) or 076 330 1688

Kind regards,

Alliola Myburgh

Please follow the link below to complete the survey:

<https://redcap.core.wits.ac.za/redcap/surveys/?s=MNRT8HW7AL>

---

ELHerisa <otooffice@ulweb.co.za>  
To: Alliola Myburgh <alliolamyburgh4@gmail.com>  
Cc: Leathicia Venter <leathicia@gmail.com>

Thu, Feb 28, 2019 at 12:31 PM

Leathicia please Invoice R500

## Appendix F: Permission for the survey to be sent out via RuReSA



Alliola Grobler <alliolamyburgh4@gmail.com>

### Fwd: [RuReSA] Digest for rural-rehab-sa@googlegroups.com - 6 updates in 6 topics

Alliola Grobler <alliolamyburgh4@gmail.com>  
To: Alicia Myburgh <alliolamyburgh4@gmail.com>

Mon, Feb 1, 2021 at 9:23 PM

From: rural-rehab-sa@googlegroups.com  
Subject: [RuReSA] Digest for rural-rehab-sa@googlegroups.com - 6 updates in 6 topics  
Date: 14 March 2019 at 8:54:14 AM SAST  
To: Digest recipients <rural-rehab-sa@googlegroups.com>

rural-rehab-sa@googlegroups.com

Google Groups

#### Topic digest

[View all topics](#)

- [Fw: Free Film Online : Disability & Sexuality - 1 Update](#)
- [please assist masters student with Study on use of Cerebral Visual Motor Impairment Questionnaire for CP Children - 1 Update](#)
- [Disability Inclusion in Education Online Course - 1 Update](#)
- [March Newsletter 2019 - 1 Update](#)
- [Rehabilitation Research in SA: Survey invitation - please ALL give input for RuReSA - 1 Update](#)
- [Sleep Intervention survey for OTs - 1 Update](#)

#### Sleep intervention survey for OTs

Rural Rehab SA NPO <ruralrehabsa@gmail.com>: Mar 13 09:54AM +0200

Good day,

Sleep Intervention survey

Good day,

My name is Alicia Myburgh, I am currently doing my masters in occupational therapy at the University of the Witwatersrand. I would like to invite you to take part in a survey concerning OT interventions provided for children with sleep disorders within SA.

The overall aim of this study is to describe current occupational therapy practice with the occupation of sleep in children. Participation is entirely voluntary, and completion of the survey will be assumed as informed consent. The survey will require approximately 10 to 20 minutes of your time in which you will tick or write a short answer to each question.

The information that you provide will be confidential and anonymous as this questionnaire is completed online and therefore, I will not have access to your personal details.

This study has been approved by the Human Research Ethics Committee (Medical) of the University of the Witwatersrand, Johannesburg (M181053).

If you have any questions or queries about the research, please contact:

Contact details of researcher: Alicia Myburgh [alicia.clevermeot@gmail.com](mailto:alicia.clevermeot@gmail.com)

<<mailto:alicia.clevermeot@gmail.com>> or 076 330 1689

Kind regards,  
Alicia Myburgh

Please follow the link below to complete the survey:

<https://redcap.core.wits.ac.za/redcap/surveys/?s=MNRT8HW7AL> <<https://redcap.core.wits.ac.za/redcap/surveys/?s=MNRT8HW7AL>>

[Back to top](#)

[Quoted text hidden]

## Appendix G: Study information document



### STUDY INFORMATION DOCUMENT

**Study title: Occupational therapy interventions for sleep disorders amongst children in SA.**

**Good day,**

I, Alicia Myburgh, am currently studying my master's degree in occupational therapy at the University of the Witwatersrand. As part of the requirements of my degree, I am required to conduct a research project. My research project will investigate 'Occupational therapy interventions for sleep disorders amongst children in SA'. The overall aim of this study is to describe current occupational therapy practice with the occupation of sleep in children. Thereby, determining the profile of the occupational therapists providing sleep interventions; establishing the current practice for sleep interventions; and determining the extent and strength of undergraduate and postgraduate training received by occupational therapist offering sleep interventions to children in South Africa.

I am therefore inviting you to take part in this research study. Participation is entirely voluntary and even if you do agree to participate, you may withdraw from the study at any point without providing a reason for your withdrawal.

If you agree to participate in this study, you will be required to complete an online questionnaire which you can complete in your own time. The questionnaire consists of consist of 16 questions and will require approximately 20 to 30 minutes of your time. The questions require you to tick or write a short answer to each question. Completion of the survey will be assumed as informed consent.

There are no risks, side effects or discomforts to this study. There is no immediate personal benefit, but I hope that your participation in this study will assist in defining occupational therapy practice within this area.

The information that you provide will be confidential and anonymous as this questionnaire is completed online and therefore, I will not have access to your personal details. During this process, the information collected will be shared with me and my supervisor. Upon completion, the results will be available on request.

If you have any questions or queries about the research, please contact:

**Contact details of researcher:** Alicia Myburgh [alicia.clevermeot@gmail.com](mailto:alicia.clevermeot@gmail.com) 076 330 1689

**Contact details of supervisor:** Olindah Silaule at [olindah.silaule@wits.ac.za](mailto:olindah.silaule@wits.ac.za) 011 717 3701

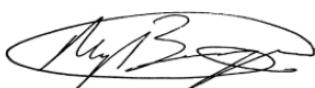
This study has been approved by the Human Research Ethics Committee (Medical) of the University of the Witwatersrand, Johannesburg ("Committee"). A principal function of this Committee is to safeguard the rights and dignity of all human subjects who agree to participate in a research project and the integrity of the research.

If you have any concern over the way the study is being conducted, please contact the Chairperson of this Committee who is Professor Clement Penny, who may be contacted on telephone number 011 717 2301, or by e-mail on [Clement.Penny@wits.ac.za](mailto:Clement.Penny@wits.ac.za). The telephone numbers for the Committee secretariat are 011 717 2700/1234 and the e-mail addresses are [Zanele.Ndlovu@wits.ac.za](mailto:Zanele.Ndlovu@wits.ac.za) and [Rhulani.Mukansi@wits.ac.za](mailto:Rhulani.Mukansi@wits.ac.za)

If you agree to take part on the study, kindly tick the box to continue with the survey.

Thank you for reading this Study Information Sheet.

Alicia Myburgh



Date: 25 June 2018

## Appendix H: Participant consent sheet



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### PARTICIPANT CONSENT SHEET

#### Occupational therapy interventions for sleep disorders amongst children in SA

***Please check the boxes below if you agree to take part in this study.***

To whom it may concern:

- I have been given a Participant Information Sheet which explains the nature and processes involved in this study, which is attached hereto.
- I was given time to read it, or had it read to me, in the language I best understand.
- I was given time to ask any questions I wanted to and found any answers given to me to be reasonable and satisfactory.
- I believe I fully understand why the study is being conducted and what the intended outcomes will be.
- I understand that there will be no immediate benefit to me, should I agree to participate, nor will I receive any payment; conversely, participation will not cost me anything but my time.
- I understand that, even if I initially consent to take part in the study, I may subsequently withdraw at any time and would not be required to give any reasons; if that happened, any data collected about me for the purposes of the study would immediately be destroyed, unless I give consent for it to be retained
- I have been given a range of contact details, listed below. If I require further information or become concerned about any aspect of this study, I am free to speak to any of these contacts.

**Contact details:**

Alicia Myburgh, Principal Investigator, telephone no. 076 3301689, or by e-mail at [alicia.clevermeot@gmail.com](mailto:alicia.clevermeot@gmail.com),

Olindah Silaule, Supervisor, on telephone no. 011 717 3701, or by e-mail at [olindah.silaule@wits.ac.za](mailto:olindah.silaule@wits.ac.za)

Professor CB Penny, Chairperson of the Human Research Ethics Committee (Medical) at the University of Witwatersrand, on telephone no. 011 717 2301, or by e-mail at [Clement.Penny@wits.ac.za](mailto:Clement.Penny@wits.ac.za).

Ms. Z Ndlovu or Mr Rhulani Mkansi, Committee Secretariat, telephone nos.: 011 717 2700 or 1234, or by e-mail at: [Zanele.Ndlovu@wits.ac.za](mailto:Zanele.Ndlovu@wits.ac.za) or [Rhulani.Mkansi@wits.ac.za](mailto:Rhulani.Mkansi@wits.ac.za)

If you agree to participate in this study, please tick the box below to continue to the questionnaire.

☐

## Appendix I: Approval of title letter



Private Bag 3 Wits, 2050  
Fax: 027117172119  
Tel: 02711 7172076

Reference: Mrs Sandra Benn  
E-mail: [sandra.benn@wits.ac.za](mailto:sandra.benn@wits.ac.za)

27 November 2018  
Person No: 712951  
PAG

Miss A Myburgh  
P O Box 845  
Rant En Dal  
1751  
South Africa

Dear Miss Alicia Myburgh

### **Master of Science In Occupational Therapy: Approval of Title**

We have pleasure in advising that your proposal entitled *Occupational therapy interventions for sleep disorders amongst children in South Africa* has been approved. Please note that any amendments to this title have to be endorsed by the Faculty's higher degrees committee and formally approved.

Yours sincerely

A handwritten signature in black ink, appearing to read 'Sandra Benn'.

Mrs Sandra Benn  
Faculty Registrar  
Faculty of Health Sciences

## Appendix J: Editing and Proof reading Certificate

### TO WHOM IT MAY CONCERN

This is to certify the I have language edited the following Master's dissertation titled:

### **OCCUPATIONAL THERAPY INTERVENTIONS FOR SLEEP DISORDERS AMONGST CHILDREN IN SOUTH AFRICA**

by

**Alicia Myburgh**

A dissertation submitted to the Faculty of Health Sciences, University of the Witwatersrand, Johannesburg, in fulfilment of the requirements for the degree of Master of Science in Occupational Therapy

Johannesburg 2020

Signed  Date: 27<sup>th</sup> March 2021

Kathleen Wood (ID no 4603190074083)

Academic Language Editor



## Appendix K: Plagiarism report

| Plagiarism         |                                                                                                                        |              |                |
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| 84 | Gloria Frolek Clark, Karrie L. Kingsley. "Occupational Therapy Practice Guidelines for Early Childhood: Birth–5 Years", American Journal of Occupational Therapy, 2020<br>Publication                                                                                                                          | <1% |
| 85 | Omar A. Al-Farsi, Yahya M. Al-Farsi, Marwan M. Al-Sharbati, Samir Al-Adawi. "Sleep habits and sleep disorders among children with autism spectrum disorders, intellectual disabilities and typically developing children in Oman: a case-control study", Early Child Development and Care, 2018<br>Publication | <1% |
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