THE EFFECT OF A MOTOR SKILLS EXERCISE PROGRAMME ON QUALITY OF LIFE AND MOTOR SKILLS DEVELOPMENT IN HARD OF HEARING CHILDREN IN GRADE R TO GRADE 2.

DEIDRÉ JOHNSON

2521584

Thesis presented in fulfilment of the requirements for the degree of Magister Scientiae in Biokinetics, in the Department of Sport, Recreation and Exercise Science, University of the Western Cape

Supervisor: Professor Susan H. Bassett

Co-supervisor: Dr Barry Andrews

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DECLARATION

I hereby declare that "*The effect of a motor skills exercise programme on quality of life and motor skills development in hard of hearing children in Grade R to Grade 2"*, is my own work, that it has not been submitted before for any other degree or examination at any other university, and that the sources I have used have been indicated and acknowledged as completed references.

Deidré Johnson **29 February 2019**

Signed _____

ABSTRACT

Background: Hearing loss in children can contribute to a loss or delay in motor skills development and has been shown to negatively affect their participation in physical activity. Lack of physical activity may then further delay motor and balance skill development and therefore impact on their health-related quality of life.

Aim: The aim of this study was to determine the effects of a 12-week exercise intervention on motor control abilities in hard of hearing children in Grade R to Grade 3 in Cape Town, and on the parent's perceptions of their child's health-related quality of life.

Methods: A pre-test post-test single group design was used to evaluate the effectiveness of an exercise intervention programme on motor skill development and quality of life of children aged four to nine, using a motor assessment battery and a health-related quality of life questionnaire. Thirty children who are hearing impaired participated in this study and received a 12-week programme of physical activity, provided twice a week for 1 hour. They were split into two age bands for motor assessment testing: Age band 1 (4-6 years, n=12), and age band 2 (7-9 years, n=18) pre- and post-intervention. All the children completed tests within three domains: Manual Dexterity, Aiming and Catching and Static and Dynamic Balance. Two questionnaires were administered (pre- and post-intervention) to the parents of the children, depending on their child's age. The TNO-AZL Preschool Children's Quality of Life questionnaire was administered to the parents/guardians of children aged 4-5 years (n=12) and the TNO-AZL Child Quality of Life questionnaire was administered to the parents/guardians of children aged 6-9 years (n=18). In both questionnaires, the following domains are covered by specific scales: Body (assessing the emotional impact of physical complaints), Motor (motoric functioning), Autonomy, Cognition, Social (interaction with parents and peers).

Results: For the 4-6-year olds, there were significant improvements noted in Catching a beanbag, as well as the Stork stand tests. For the 7-9-year olds, there were significant improvements demonstrated in completing the Placing pegs test as well as in the One-leg hopping and Walking heel-to-toe forward tests. The parents/guardians of children aged 4-5 years who completed the intervention, felt that their child displayed improvements in both cognitive abilities and positive emotions post-intervention. Similarly, parents of children aged 6-9 who completed the intervention also felt that their child displayed a positive change in their cognitive abilities and in the emotional impact of physical complaints in their 'Body' domain.

Conclusion: Consequently, there is still great room for improvement with regards to quality of life and motor skill development in these children. This study, therefore, is a stepping stone into future research on motor skills and quality of life in primary school children with a hearing impairment.

DEDICATION

I wish to dedicate this thesis to my husband Travis and our two sons, Jesse and Alex.

Travis, your unfaltering love and support, carried me through this. You have taught me to be courageous and to have faith, even in the darkest and most difficult times.
You never gave up on me, ever… I love you.

Jesse and Alex, you both have inspired me to be better and to face challenges head on. Thank you for showing me what patience and perseverance truly means, and that giving up is just not an option.
I love you both infinitely.
Mom.

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My time as a master's student in Biokinetics has come to an end, and it is time to look back and reflect on what I have learnt. Writing a master's thesis was like a journey into the unknown. Appreciating that process has been an important learning experience for me. This study has given me the opportunity to see things that I knew in a new perspective as well as learning new things and gaining more knowledge. Doing the research and writing off campus has at times been lonely. Still, I have not done this journey entirely alone and I would like to acknowledge and thank the following individuals who have played an important role in the successful completion of this thesis:

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Travis, without you, this achievement would *not* have been possible… elephant shoe.

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LIST OF ABBREVIATIONS

AC	Aiming and Catching
ASHA	American Speech-Language-Hearing Association
BOTMP	Bruininks–Oseretsky Test of Motor Proficiency
dB	Decibels (dB)
DCD	Developmental Coordination Disorder
DHL	Disabling Hearing Loss
HRQoL	Health-Related Quality of Life
HI	Hearing impairment
MD	Manual Dexterity
MABC	Movement Assessment Battery for Children
MABC-2	Movement Assessment Battery for Children – Second Edition
PDMS	Peabody Developmental Motor Scales
SDB	Static and Dynamic Balance
TGMD	Test of Gross Motor Development
TAPQOL	TNO-AZL Preschool Children's Quality of Life questionnaire
TACQOL	TNO-AZL Child Quality of Life questionnaire
WHO	World Health Organization

CHAPTER 1

INTRODUCTION

This chapter introduces the research study conducted. It includes the background and rationale of the study, the purpose of the research, aim and objectives as well as hypotheses. The abbreviations used within the context of the study are operationally defined, and an outline of each of the chapters in the research is included.

BACKGROUND

"Blindness cuts us off from things, but deafness cuts us off from people." Helen Keller

Hearing is one of the most important senses for human communication. At any stage in one's life, the loss of hearing or hearing impairment (HI) will severely hinder the ways in which we communicate with each other and influence an individual's quality of life (Gondim et al., 2012). In 2017 the World Health Organization (WHO, 2017) reported that the estimated global population living with disabling hearing loss (DHL) increased to 360 million people worldwide. DHL can be defined as a hearing loss that is greater than 40 decibels (dB), which can also be categorized as moderate, severe or profound hearing loss, depending on the range of decibels lost.

Hearing is one of our most important senses, it is reported that each year hearing loss affects 0.6% of births in developing countries such as South Africa (compared with 0.2% in developed countries). Hearing loss is the most prevalent sensory disorder in childhood (Störbeck, 2012). This prevalence can be further increased in children who are subjected to

an often-untreated middle ear infection called otitis media (Butler, 2012). Otitis media, also known as a middle ear infection, is prevalent in sub Saharan Africa, with more than half of the diagnoses occurring in children younger than 10 years of age (Tiedt, Butler & Hallbauer, 2013).

Childhood hearing loss, whether congenital or acquired, is associated with speech development, linguistic and cognitive skill delays often hindering the learning process and resulting in poor schooling (Burke, Shenton & Taylor 2013; Olusanya 2011). In addition, Störbeck (2012) associated childhood hearing loss with problems with employment and societal integration in adulthood. Hearing loss and deafness may hinder the normal maturation and development of children socially, physically and economically. Hearing impairment is caused by various determining factors and has to be regarded as a multifaceted condition (Rajendran & Roy, 2011). In a study investigating the global burden of hearing loss, Mathers, Smith and Concha (2001) stated that some consequences of HI are an inability to interpret speech sounds, an impediment in language cognition and acquisition, economic and educational disadvantage, social isolation and stigmatization. Therefore, it can be assumed that all of the above factors could negatively influence the quality of life of children with a HI.

According to the American Speech-Language-Hearing Association (ASHA, 2015) hearing loss affects children in four main ways:

1. It causes delay in the development of speech and language skills including receptive and expressive communication.
2. The language deficit then causes learning problems that result in reduced academic success.

3. Communication difficulties often lead to social isolation and poor self-regard; and
4. It may have an impact on occupational choices later in life.

In addition, hearing loss in childhood puts a child at risk for language, social, and academic complications. Even if the hearing loss is mild, it can negatively affect their quality of life (Burkey, 2006). Children with hearing impairment due to a hearing loss or auditory processing problems continue to be at risk for developmental delays (ASHA, 2015).

Regular physical activity (PA) has been linked with physiological, motor developmental, psychosocial, and most recently cognitive aspects of growth and development in childhood and adolescence (Laukkanen, 2016). In addition, play is critical for language and communication development, cognitive, physical, social, and emotional development of young children (Ginsburg, 2007). In saying this spontaneous or free play is known to be delayed in children who have a HI, this is primarily due to the strong relationship between play and language development (or the lack thereof).

Many studies have examined play in children with hearing impairment. A child with a HI can be as capable and knowledgeable as a typically developing one. Children with hearing loss inevitably play, think, learn, or behave almost exactly like their hearing peers. Some research has compared play behaviour patterns of children with and without hearing impairment; some similarities were found between the children with a HI and children without a HI, but others established differences that were strongly associated with language levels (Higginbotham & Baker, 1981; Spencer & Marschark, 2010).

Improvement in motor developmental delays and balance skills have been attributed to by physical activity participation (Hartman, Houwen, & Visscher, 2011; Majlesi, Farahpour, Azadian, & Amini, 2014). Furthermore, physical activity also influences the psychomotor domain which is characterized by the ability to become proficient in a physical skill (Lieberman, Volding, & Winnick. 2004). According to Hogan (2009), children with a HI have a predisposition to be socially inactive, which may lead to the avoidance of participating in PA. Lack of PA, known as a sedentary lifestyle, has a direct correlation with decreased health-related quality of life (Lieberman et al. 2004).

This sedentary lifestyle, as reported by Hopper (2007), is seen by children with a HI having lower fitness levels compared with children who do not have a HI, reports. Because of this, children with a HI may be more susceptible to delays in motor and balance skill development. Participating in physical activity has been found to impede motor developmental delays, and improve balance skills (Hartman et al., 2011; Majlesi et al., 2014). Therefore, to improve or diminish delays in motor and balance skill development, and to improve postural control and stability in children with a HI, adequate scientific studies are needed to determine the treatments and interventions that are most effective.

STATEMENT OF THE PROBLEM

Hearing Impairment is an internationally recognized disability that affects millions of people. Not much research has been completed on improving motor and developmental disorders as well as social dilemmas in children with a HI, particularly in South Africa. Both motor and developmental disorders because of hearing loss as well as quality of life for instance, can be improved on by means of exercise therapy.

The consequences of hearing loss in children can contribute to a loss or delay in motor skills development (Rajendran & Roy, 2011), such as balance. Balance is maintained by receiving input from three main sensory systems in the body. They are the vestibular, somatosensory and visual systems. The vestibular system uses the head's position to determine spatial orientation, motion, and equilibrium. The somatosensory system uses the muscular and skeletal systems to give proprioceptive information about how the body is moving. The visual system sends visual information to the brain about the body's position in its environments. The brain receives, interprets, and processes information from all three of these systems in order to maintain balance in the body. Therefore, if there is a problem with the input from one of these systems, the body's ability to maintain balance may be affected.

Static and dynamic balance are regarded as two separate types of balance; however, balance is regarded as one motor ability (Magill, 2007). Static balance refers to maintaining equilibrium whist in a stationary position, whereas dynamic balance refers to maintaining equilibrium whilst in motion. According to Watson & Black (2008), a damaged vestibular system, which is important in providing sensory information of equilibrium to the brain, may lead to balance problems. It has been established that various levels of vestibular dysfunction are present in 30% to 70% of children with a HI (De Kegel, Maes, Baetens, Dhooge, & Van Waelvelde, 2012; Cushing, Gordon, James, Papsin, & Rutka, 2008, p. 12). Children with a HI may subsequently be predisposed to interference in the development of static and dynamic balance reactions and coordination as well as fundamental motor skills, due to a dysfunctional vestibular system (Chilosi et al., 2010). Somatosensory skills and balance have been found to significantly improve when the proprioception system is trained. Sustaining and improving balance skills, means that children with a HI may be able to maintain postural control and stability, even as well as children without a HI.

Logan, Robinson, Wilson and Lucas (2011) highlighted the need for further research to understand the value of motor skill interventions, more specifically to determine the overall effect of motor skill intervention programme on the improvement of motor skill ability in children, as well as to determine the effectiveness of motor skill interventions comparative to free play in the improvement motor proficiency.

Hearing impairment has also been shown to negatively affect children's social well-being (Rajendran & Roy, 2011). Family quality of life research propose to investigate the parent/guardian's views of how their everyday lives are affected by their child with a disability (Brown, Crisp, Wang, & Iarocci, 2006). Therefore, this research focused on the effects of an exercise intervention on the Health-Related Quality of Life (HRQoL) and motor skills of children who have a HI.

SIGNIFICANCE

The focus of this study was how exercise/physical activity could positively contribute to motor control ability and quality of life of hard of hearing children.

The development of motor skills in children is not an innate maturational process (Logan et al., 2011). Therefore, it is important that these skills are learnt, practiced and reinforced from an early age. Research shows that motor skill interventions are effective in the improvement of motor skills in children.

Jain et al. (2008) claimed that hearing defects affect general behaviour, compromising the level of social functioning and are often disregarded because of ignorance, fear, stigma,

misconception, and negative viewpoints. When a child has hearing loss, there are a number of problems that present. These range from suspecting a problem from the beginning, receiving the diagnosis of the child's condition, breaking the bad news, the need for counselling and family support to initiating intervention and management (such as making use of a hearing aid or cochlear implant) and, more importantly the monitoring of these children.

Therefore, this study attempted to provide understanding and promote awareness of the benefits of physical activity to learners who have a HI, to their educators, parents/guardians and the general public. Although it has limitations, therapists and educators may benefit from the results, as it may raise their awareness and knowledge, and provide insight as to how to influence motor learning in children with HI associated Developmental Coordination Disorder (DCD) and HRQoL, by promoting an exercise intervention.

AIM

The aim of this study was to determine the effects of a 12-week exercise intervention on motor control abilities in hard of hearing children in Grade R to Grade 3 in Cape Town, and on the parent/guardian's perceptions of their child's health-related quality of life.

OBJECTIVES

The specific objectives of this study were to determine:

- if there were any changes in motor abilities of the hard of hearing children as a result of an exercise intervention.
- the parents/guardians' perspective of the influence of participation in physical activity on their child's health-related quality of life.

RESEARCH HYPOTHESES

It was hypothesised that:

1. The exercise intervention would enhance the motor skills development/ability of hard of hearing children.
2. Parents/guardians would notice the positive effects of the intervention on the HRQoL of their children.

CHAPTER OUTLINES

This research is presented in five chapters:

Chapter 1 provides an introduction to the study and includes the background to and rationale for the study, aim and objectives as well as hypotheses, and an operational definition of all abbreviations used in the study.

Chapter 2 is the literature review and provides the theoretical framework and rationale for the study. This chapter includes information on standard motor skill development, motor development delays in children with a HI as well as the importance of physical activity and health related quality of life in children with a HI.

In Chapter 3, the methodology is outlined and incorporates research aims and design. The participant selection and description as well as the research measures used are presented. Data collection procedures, ethical considerations, as well as reliability, validity and data analysis methods are discussed and presented.

Chapter 4 provides an overview of the results in accordance with the objectives and hypotheses of the study. The findings are critically discussed in relation to current literature. Data is organised, analysed and interpreted so that conclusions can be drawn regarding whether the researcher designed exercise intervention had an effect on the motor skill ability and health-related quality of life in children with a HI.

In Chapter 5, the results, conclusions and critical evaluation of the study are discussed, followed by the implications and recommendations for future research.

The Appendices supply important information for the understanding of the data collection and analysis procedure as well as replication of the study.

CHAPTER SUMMARY

This chapter provided the rationale for the study by describing background information such as the current prevalence rates worldwide as well as nationally. This chapter also included an explanation of abbreviations and an outline of chapters that further described the aims and execution of the research study.

CHAPTER TWO

LITERATURE REVIEW

"If I hadn't lost my hearing, I wouldn't be where I am now. It forced me to maximize my own potential. I have to be better than the average person to succeed." Lou Ferrigno

INTRODUCTION

This chapter aims to provide the theoretical framework and justification for the study. It includes information on the prevalence and classification of hearing impairment (HI), the importance of physical activity and exercise (PA), standard motor skill development, and motor development delays in children with a HI as well as the importance of physical activity and exercise, and quality of life in children with a HI.

HEARING IMPAIRMENT

Hearing impairment is defined as any type or degree of hearing loss as a result of a problem or damage to one or more parts of the ear (Ross, 2006). The impairment may be present at birth (congenital), caused by factors such as genetics, prematurity or low birth weight, and complications during birth, which may result in oxygen deprivation, medications, maternal rubella and diseases such as meningitis. Hearing impairment can also be acquired after birth via trauma to the head or ear, recurrent ear infections (otitis media) or progressively over time as it presents in some of the elderly. The impairment may present itself in one or both ears and the hearing loss may be symmetrical or asymmetrical, where one ear has less, equal or more hearing loss than the other (Ross, 2006).

People who are hard of hearing, varying from slight to possibly severe, may use a hearing aid to help amplify sounds. A hearing aid will render useless for the population who have severe to profound hearing loss. Depending on the severity of the hearing loss, some of these people may be eligible for a cochlear implant. A cochlear implant is not like a hearing aid that is worn in the ear and with the help of a microphone, amplifies sound. Instead, a cochlear implant is an implanted electronic device to stimulate the cochlear nerve when sound is received via a sound processor that resides on the outside of the skin and usually worn behind the ear (Ross, 2006).

Prevalence of hearing impairment

The World Health Organisation (WHO, 2012) estimated that 5.3% of the world's population have disabling hearing loss. Of the world's hearing-impaired population, 328 million (91%) of these are adults and 32 million (9%) of these are children. The prevalence of disabling hearing loss in children is greatest in South Asia, Asia Pacific and Sub-Saharan Africa. Sub-Saharan Africa consists of Central Africa, West Africa, East Africa, and relevant to this study, which was conducted in Southern Africa (WHO, 2012).

Annually, hearing impairment affects an estimated 798 000 new-born babies, who are either born with hearing impairment or acquire early onset permanent bilateral hearing loss (Olusanya, Wirz & Luxon, 2008). At least 90% of these babies exist in developing third-world countries around the world, like South Africa, suggesting that every day almost 2000 infants with some degree of hearing impairment or hearing loss are born (Swanepoel, Storbeck & Friedland, 2009). Although not many comprehensive people studies for Africa exist, available reports suggest that the prevalence of profound hearing loss is more than the

estimated 20-30% of children with permanent childhood hearing loss in the developed first-world countries (Olusanya et al., 2008; Westerberg, Lukwago, Zaramba, Bubikere & Steward, 2008; Kral & O'Donoghue, 2010; Saunders & Barrs, 2011).

In South Africa, hearing disability accounted for twenty percent of the 2 255 982 million people who were classified as people with a disability (Statistics South Africa [StatsSA], 2003). The Deaf Federation of South Africa (Deaf SA, 2006) suggests that the recorded number of people with a hearing impairment in South Africa (383 408, as indicated by the 1996 census), is an under-representation of the prevalence of people who are hearing impaired in South Africa, perhaps due to the negative stigma associated with being identified as a person with a disability. Figure 2.1 shows the distribution of people who are hearing impaired in South Africa (Department of Education [DoE], 2001, p. 14). This excludes those who are in institutions, and therefore the figure could be much higher. There are an estimated half a million people who are hard of hearing in South Africa, nearly 1% of the total population are profoundly hard of hearing while 3% are extremely hard of hearing (DeafSA, 2006).

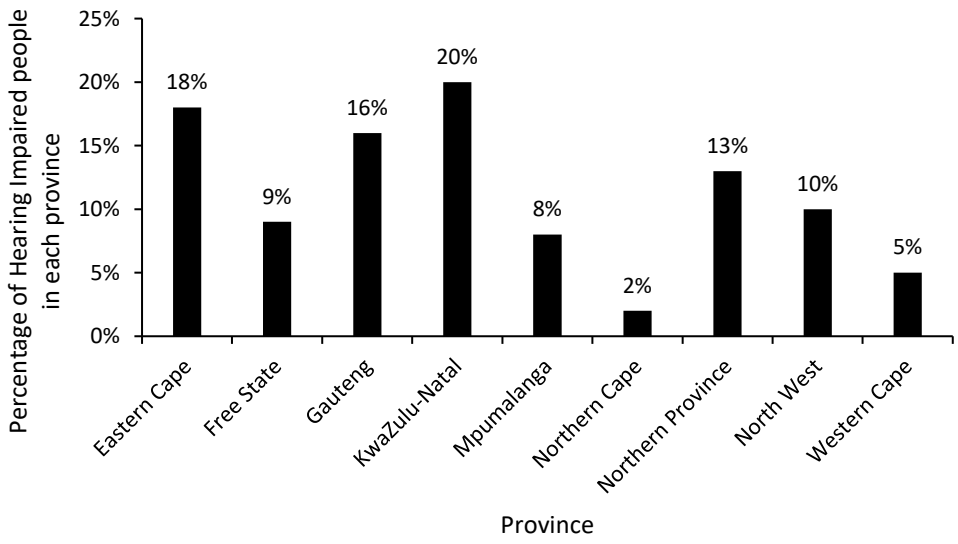
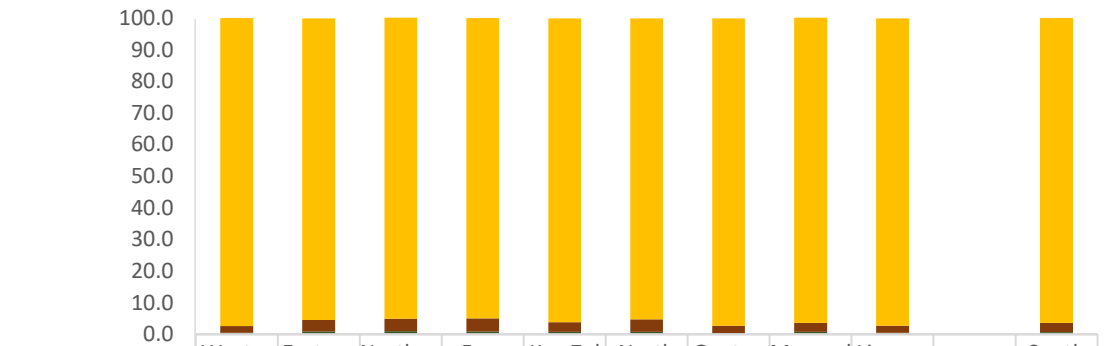


Figure 2.1: The distribution of hearing impaired people in South Africa (DoE, 2001, p. 14).

According to StatsSA (2012) the national profile shows that about 3% of the population who are five years and older had mild difficulty in hearing, while those who experienced severe difficulty in hearing constituted less than 1%. Severe difficulty in hearing was more prevalent among the older ages.

To be more precise, Figure 2.2 shows that 96.4% of the population aged five years and older had no difficulty in hearing. Provincial variations show that Western Cape, Gauteng and Limpopo had the most elevated extents (97%), whereas Eastern Cape, Northern Cape, Free State and North West had the least extents (95%). The figure also shows that 2.9% of persons in South Africa had mild difficulty in hearing and 0.7% had severe difficulty. The provinces with the highest proportion of persons with mild difficulty in hearing were Free State (4.1%), followed by Northern Cape and North West with 3.9% each. Western Cape had the least extent (2.1%), shadowed by Limpopo (2.2%) and Gauteng (2.3%). The provinces with the most elevated extent of persons with severe difficulty in hearing were Eastern Cape and Free State (0.9% each) (StatsSA, 2012, p. 27).



	Western Cape	Eastern Cape	Northen Cape	Free State	KwaZulu-Natal	North West	Gauteng	Mpumalanga	Limpopo		South Africa
None	97.4	95.4	95.2	95.0	96.1	95.2	97.2	96.5	97.2		96.4
Mild difficulty	2.1	3.6	3.9	4.1	3.0	3.9	2.3	2.8	2.2		2.9
Severe difficulty	0.5	0.9	1.0	0.9	0.8	0.8	0.4	0.7	0.5		0.7
Do not know	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0		0.0

Figure 2.2: Percentage distribution of persons aged 5 years and older by degree of difficulty in hearing per province in South Africa (Adapted from StatsSA, 2012)

The statistics from the latest Census in 2011 (StatsSA, 2012) projected that approximately 981 000 South Africans aged five years and older had some degree of hearing impairment. This shows that the amount of people who are hearing impaired in South Africa has more than doubled in the last fifteen years. As indicated by Rajendran & Roy (2011), hearing loss is the third most common congenital and acquired disease in children, affecting 1 to 3 children in every 1000, which frequently leads to psycho-intellectual and social developmental disorders, because of them encountering trouble in connecting and interacting with their environment.

One of the many results of early onset hearing loss and congenital (born with) hearing loss is the relapse of spoken dialect and lack in capability to communicate effectively. As a result, this affects learning, reading ability, instructive and educational accomplishments, as well employment opportunities later in life (Kral & O'Donoghue, 2010; Mohr et al., 2000).

Classification of HI

According to WHO (2012), hearing loss is measured in decibels (dB), which is the intensity of the sound i.e. the sound volume, which could be loud or soft, and in hertz (Hz), which is the frequency of the sound i.e. the pitch, which could be high or low. The standard range of frequencies is between 20 and 20,000 Hz. For the most part, HI individuals struggle to hear very high or very low-pitched sounds. Hearing ranges from minus 10 dB (standard hearing) to 120 dB (profound hearing loss). The degree of hearing loss is directly related to the decibel number, the greater the hearing loss the higher the decibel measure. Hearing loss is measured as slight, moderate, moderate-to-severe, severe and profound (Table 2.1).

In addition, hearing loss can be classified as conductive, sensorineural, or mixed (Hopper, 2007). Conductive hearing loss results from a blockage or when other auxiliary issues meddle with how sound gets directed and conducted through the ear, making sounds seem softer. All frequencies of hearing are affected in conductive hearing loss.

Table 2.1: WHO criteria for grading of hearing loss (WHO, 2012)

Grade of impairment	Corresponding audiometric ISO value	Performance	Recommendations
0 - No impairment	25 dB or better (better ear)	None or very slight hearing problems.	
1 - Slight impairment	26–40 dB (better ear)	Able to hear and repeat words spoken in normal (volume and pitch) voice at 1 metre.	Counselling is recommended, and hearing aids may be needed.
2 - Moderate impairment	41–60 dB (better ear)	Able to hear and repeat words spoken in raised (volume and pitch) voice at 1 metre.	Hearing aids are usually recommended.
3 - Severe impairment	61–80 dB (better ear)	Able to hear some words when shouted into better ear.	Hearing aids are needed. If no hearing aids available, lip reading, and signing should be taught.
4 - Profound impairment including deafness	81 dB or greater (better ear)	Unable to hear even at shouted voice.	Hearing aids may help with understanding words. Additional rehabilitation needed. Lip reading and signing essential.

Disabling hearing impairment

Sensorineural hearing loss is permanent and can range from mild to profound. It is caused by damage to the cochlea or the auditory nerve (Bevan, 1988), which are situated in the inner ear. Sound stimuli are transmitted through the cochlea and auditory nerve to the brain. As a result of the damaged nerve fibres there is inadequate sound transmission, hence the inability of the brain to interpret the sound 'heard'. The most common type of sensorineural hearing loss is caused by the outer hair cells (cilia) malfunctioning (Wong & Ryan, 2015). A person with this type of hearing loss will experience challenges in deciphering speech and different intensities and frequencies of sounds. Sensorineural hearing loss, affects the ability to hear certain frequencies more than others, for instance, the incumbent might not be able to hear high pitched sound and only lower pitched sounds, or vice versa. In many cases, hearing aids can help this person hear 'normally', however the sounds may be indistinct and soft, even with a hearing aid or they may be impossible to hear at all. Mixed hearing loss happens when someone has both conductive and sensorineural hearing problems (Cunningham & Tucci, 2017).

In more severe cases, both the outer and inner ear cilia are damaged and affected. This type of hearing loss is called Auditory Neuropathy Spectrum Disorder (ANSD) (Morlet, 2016) which is also a type of permanent hearing loss and usually individuals with this condition can benefit from cochlear implants. In some instances that have been reported, the outer cilia are intact, but the inner cilia or the auditory nerve are damaged. In cases like these the transmission of sound stimuli from the inner ear to the brain is then muddled or not transmitted. Children with ANSD can develop strong communication and linguistic skills with the help of cochlear implants and rehabilitation such as speech therapy and sign language.

It is therefore evident that the degree and severity of HI can differ extensively from person to person. Some people with HI will be able to hear partially and others may not be able to hear at all. Often, if there is a lot of background noise, the person with HI will struggle a lot more. In some types of hearing loss, the HI individual will struggle a lot more if there is excessive background noise. In addition, one or both ears may be affected, and the severity of the impairment may be worse in one ear than in the other.

PHYSICAL ACTIVITY AND EXERCISE

"In my letters to my children, I regularly urged them to exercise." (Nelson Mandela: Long Walk to Freedom, 1994, p 81)

Movement is a natural and inborn part of a human's every day activities and plays an important role in the advancement of a child's physical, intellectual and social qualities (Cools, De Martelaar, Samaey and Andries 2009). Children who are considered 'normal' or 'ordinary' at first sight, may encounter intricacies with the acquisition and execution of motor abilities. These children may regularly be portrayed as ungainly or uncoordinated (Smyth, 1992) and the reason for the debilitated motor execution is typically attributed to an underlying problem that is not always easy to notice.

Research has established that being physically active and fit positively contributes to one's overall health and well-being. People who have adequate levels of cardio-respiratory fitness and endurance, muscular strength and endurance, and who are of normal body fat percentage are able to participate in activities of daily living and recreation without unwarranted strain or exhaustion (Pate, Baranowski, Dowda, & Trost. 1996; Kohl & Hobbs, 1998).

In addition, maintaining a satisfactory level of physical fitness is of paramount importance in reducing risk factors for many diseases, especially hypokinetic diseases, such as coronary heart disease, diabetes, obesity, and lower back pain, which are directly associated with inactive lifestyles (Wilmore & Costill, 1994; Rowland, 1999). According to Strong et al. (2005) and WHO (2010), children between the ages of five and 17 years should accumulate no less than an hour of moderate to vigorous physical activity every day to maintain their well-being. Physical activity can include sport, play, games, recreation, and transportation by means of walking, running, cycling, skateboarding etc., physical education or prearranged exercise programmes.

Participating in as we know it, positively contributes to motor skill and studies propose that motor proficiency has an important role and impact in ensuring involvement in physical activity at a later stage in everyday life (Seefeldt, 1980; Clark & Metcalfe, 2002; Gallahue & Ozman, 2006; Stodden et al., 2008; Barnett, Van Beurden, Morgan, Brooks & Beard, 2009). This supports the belief that the development of motor skills are related to ongoing physical activity amid youth and pre-adulthood (Fulton, Burgeson & Perry 2001; McKenzie et al., 2004; Okely, Booth & Chey 2004; Raudsepp & Päll, 2006). Additional literature suggests that children and adolescents who enjoy being physically active may lead to increased adult participation, thus improving their prosperity for the duration of their life (Kuth & Cooper, 1992; Glenmark, Hedberg & Jansson 1994; Sallis & Patrick, 1994; Martens, 1996; McKenzie et al., 2004). Knowing the importance of fitness and the associated risk factors for disease, it is of concern that numerous studies have found that children who are not hearing impaired to have higher levels of fitness than children who are hearing impaired (Francis, 1999; Goodman & Hopper, 1992).

Pre-school and primary school years are recommended to be the best time to strive towards motor skill improvements. This may be due to the likelihood that children supposedly have not yet developed bad physical activity habits, they are not as self-conscious about poor performance or being teased and ridiculed by their peers, and are fearless and to a certain extent, ignorant of injuries. It is imperative that sufficient time and resources are allocated for optimal aptitude learning and advancement during this period. This period is also known as a "window of opportunity" because of the speed and ease at which children are able to learn new skills (Gallahue & Donnely, 2003). It is amid this significant period of opportunity that the young brain is most receptive to applicable stimulation compared to any other given time during human development (Chugani, 1998). Consequently, instigating an intervention programme during this period may result in more significant outcomes than at a later developmental stage.

Literature is progressively providing more sound evidence that children may in actual fact be less physically active than suspected (Kelly et al., 2004). In 2007, Steyn found that approximately one third of South African adolescent boys and almost half of the South African girl population were living sedentary lives and 22% of boys and 27% of girls spend more than three hours a day, watching television. This is learned and habitual behaviour which might have begun long before the start of their adolescent years. Other than television, the attraction to and interest in computers, electronics and games has escalated the time children spend being inactive (Andersen, Crespo, Bartlett, Cheskin & Pratt, 1998; Hill & Peters, 1998; Sallis, et al., 1999). Advancements and improvements seen in technology and transportation today has additionally led to a decreased need for daily physical activity (Hill & Peters, 1998; Piek et al., 2010). As a result, populations have shown lower levels of walking and consequently, decreased physical activity levels (Lumsdon & Mitchel, 1999).

Decreased physical activity is associated with the decrease in daily energy requirements and will ultimately lead to unwarranted weight gain and obesity (Hill & Peters, 1998).

According to Pienaar (2009), children nowadays no longer have as much control over their activity habits as children in the past. Over the years environmental factors such as the increase in road traffic and 'stranger danger' have acted as barriers to physical activity and have limited the freedom of children to play outside and function independently outside their family home (Hillman, Adams & Whitelegg, 1991). Violent crimes and unsafe recreational and playing areas further reduce the opportunity and motivation for children, especially girls, to be physically active (Lopez, 2011). Research suggests the utilization of public physical activity areas such as parks and playgrounds are determined by safety accessibility. For those who fall in a lower socio-economic bracket (Cradock et al., 2005; Lopez, 2011), the limited access to community recreational facilities is also a concern. It is also concerning that these children, due to their circumstances and possible attribution to malnutrition and decrease in physical activity have been reported to perform poorer in motor activities such as speed, speed endurance and power (Mészáros et al., 2008). Tara (1992) highlighted an extensive concern that the youth of today are living progressively more sedentary lifestyles, which may be adding to underlying problems that are causing complications to motor skill advancement and performance. Eliminating physical activity and preventing children from mastering motor skills may subsequently lead to a decrease in participation in PA. This will prevent children from obtaining the recommended levels of physical activity that is required to attain and maintain good health (Van Beurden et al., 2003).

MOTOR SKILLS AND MOTOR DEVELOPMENT

"Growth comes from activity, not from intellectual understanding." Maria Montessori

Children with hearing deficits frequently have delayed motor development (Shall, 2010).

Pienaar (2009) emphasizes that physical development, including motor development, is the key aspect of children's total development and well-being and must be addressed during the early years of development. Early childhood is described as a distinctive period in a child's life as it is seen as a time when children mature and advance socially, cognitively, physically and emotionally (Garcia, Garcia, Floyd & Lawson, 2002). The term development usually refers to moving and transitioning through a series of stages, more commonly known as milestones, developmental milestones or stages of development (Cheatum & Hammond, 2000). Children generally progress through an orderly, predictable sequence of development and one stage or milestone in the sequence leads to the next (Cheatum & Hammond, 2000; Wait, 2005; Davids, Button & Bennet, 2008; Haywood & Getchell, 2009) in a systematic, methodical and permanent fashion (Haywood & Getchell, 2009; Wait, 2005).

De Jager (2009) observed how consistently each developmental stage or milestone transpires from the one before, and how development in all children occurs according to the same basic and somewhat straightforward laws, regardless of all the individual, cultural and gender differences. Milestones are the basic building blocks of all learning, thus, the sequence of the development is critical to optimal functioning.

Evidence that motor function and scholastic achievement are associated, seems to be progressing. Haapala (2013) found that enhanced motor skills are related to more efficient cognitive and intellectual functions including inhibitory control and working memory. The

review also concluded that higher cardiorespiratory fitness and enhanced motor skills contribute to enhanced academic performance (Haapala, 2013).

Physical activity can improve cognitive and mental health and great improvements in physical self-perceptions can be seen (Lubans et al., 2016), which in turn, accompanies enhanced self-esteem. In addition, researchers suggests no indication that increases in physical activity negatively affect cognitive function or academic achievement and physical activity is important for growth and development and general health. Physical activity has a positive influence on cognition as well as brain structure and function (Donnelly et al., 2016).

The damage to the cilia in sensorineural hearing loss can affect the vestibular system. The vestibular system provides sensory information of motion, equilibrium, and spatial awareness. Therefore, dysfunction of the vestibular system may lead to vertigo, disorientation, dizziness, and issues with maintaining equilibrium (Watson & Black, 2008). Several studies of motor skills in children who are hard of hearing reported deficits in balance, general dynamic coordination, visual-motor skills, and ball catching abilities and cite clear differences in reaction times and speed of movements (Savelsbergh, Netelenbos, & Whiting, 1991; Wiegersma & Van der Velde, 1983). More recently the high percentage of children with hearing impairment having poor motor performance have been observed to be directly associated with difficulties in social relationships (Fellinger, Holzinger, Aigner, Beitel, & Fellinger, 2015; McPhillips, 2015).

In children, balance is inextricably linked to the mastering of basic motor skills (Fisher et al., 2005). Balance has been defined by Pollock, Durward, Rowe and Paul (2000) as the ability to keep the body's centre of gravity within the limits of the base of support. The ability to

maintain a static posture (e.g. sitting, standing) and dynamic posture (e.g. walking) is operationally defined as static and dynamic balance respectively.

Balance relies on three main systems: vestibular, visual and somatosensory. There are five areas which play a vital role in maintenance of static balance, and standing on both legs requires (Bannister, 1969, as cited in Effgen, 1981):

1. Enough strength in the muscles of the lower extremities and trunk to hold the body upright.
2. Standard postural awareness to communicate information relating to position.
3. Standard nerve impulses from the vestibular labyrinth relating to position.
4. A central coordinating mechanism, of which the cerebellar vermis is important.
5. The activity of the higher centres involved in the maintenance of posture.

Jafari, Malayeri, Rezazadeh & HajiHeydari (2010) conducted a study to test the static and dynamic balance skills in congenitally severe to profound hearing-impaired children in comparison with age-matched children with healthy hearing. The Bruininks-Oseretsky test of motor proficiency was used for evaluation of balance skills. They found that development of static balance skills takes longer than dynamic skills. They also confirmed that, because severe to profound hearing-impaired children showed more weakness than children with healthy hearing in both static and dynamic balance abilities, functional tests of balance proficiency can help to identify balance disorders in these children.

Researchers have suggested that exercise intervention helps to improve sensory organization for gain in motor development status of children with hearing loss (Rine et al., 2004; Shah, Rao, Malawade, & Khatri, 2013). De Kegel et al., (2012) showed that children who are

hearing impaired show a trend to perform worse on both manual dexterity and ball skills abilities of MABC-2 than children who are not hearing impaired. Explanation of these findings can be given by the fact that adequate postural control is a necessary condition for acceptable motor control. These results are contrary to the research done by Effgen (1981) who stated that there was a lack of improvement in the motor abilities in children with hearing loss following exercise intervention for ten days, which was perhaps not long enough.

QUALITY OF LIFE

"Deafness separates people from people." Helen Keller

The World Health Organization (1995) defines quality of life (QOL) as "individuals' perception of their position in life in the context of culture and value systems in which they live and in relation to their goals, expectations, standards and concerns". The definition encompasses six domains of quality of life, including a physical domain, psychological domain, level of independence, social relationships, environment, and spirituality/ religion/ personal beliefs. Hearing tests do not provide a complete depiction of the impact of an individual's hearing loss. While hearing tests can provide quantifiable information regarding the status of an individual's hearing loss, they cannot provide information regarding the effect of the hearing loss on a person's everyday function, or the handicap imposed by the hearing loss (Ventry & Weinstein, 1982).

Any instrument to measure Health-Related Quality of Life (HRQoL) should be "multidimensional, consisting at the minimum of the physical, mental, and social health dimensions delineated by the WHO" (Varni, Seid, & Kurtin, 2001). Generic HRQoL

questionnaires provide a comprehensive overview of HRQoL and allow for comparisons between healthy and disease populations (Connolly & Johnson, 1999). Questionnaires about children's HRQoL can be self- or proxy- (via parent or guardian) reported. Self-report is favoured, because the child's report is usually the best source of information about what he or she is experiencing (Reeve et al., 2013; Varni, Limbers & Burwinkle, 2007). However, when children are too young i.e. under the age of eight (Varni et al., 2007, Bevans, Riley, Moon, & Forrest, 2010), cognitively impaired, ill or fatigued to complete a HRQoL instrument, parent/guardian proxy-report is recommended (Klassen, Anthony, Khan, Sung, & Klaassen, 2011). To reliably measure the impact of a chronic condition on children's HRQoL compared to their healthy peers, it is important to use validated questionnaires. The current study used the TNO-AZL Preschool Children's Quality of Life questionnaire (TAPQOL) (Fekkes, Bruil & Vogels, 2004) or the TNO-AZL Child Quality of Life questionnaire (TACQOL) (Vogels et al., 1999).

There is high variability in reported quality of life in children with hearing loss (Roland et al., 2016). However, it has been established that undetected hearing loss affects children's language, social, communicative and cognitive development (Moeller, 2000; Yoshinaga-Itano et al., 1998; Morton & Nance, 2006). Therefore, the importance of including early hearing detection and intervention into Early Childhood Development (ECD) programmes becomes pertinent. However, it has only been roughly ten years since a policy on paediatric hearing screening (Health Professionals Council of South Africa, 2007) has been put into place in South Africa. When it is considered that a number of countries have had universal new-born hearing screening programmes (e.g. USA, UK, Poland) for many years, it becomes evident that South African policies and procedure for early hearing detection and intervention are behind schedule. Many studies have highlighted the importance of implementing

screening services for children with hearing loss which provide significant information regarding the status of the individual's hearing loss. It has been estimated that less than 10% of the more than one million new-borns born annually in South Africa will have their hearing screened, implying that it is highly probable that most children with hearing loss will fail to benefit from early auditory stimulation (Theunissen & Swanepoel, 2008; Meyer, Swanepoel, Le Roux, & van der Linde, 2012; Statistics South Africa, 2013).

It is also then evident that hearing loss will have a detrimental effect on a child's development holistically, where delays in the ECD phase will greatly affect future developments in terms of education and learning, employment opportunities and ultimately quality of life. Possible consequences of childhood hearing impairment include a lack of language acquisition causing an inability to understand speech sounds and communicate effectively, socio-economic and educational disadvantage as well as social isolation (Stevens et al., 2013; Hoffman, Quittner, & Cejas, 2015; Van Gent, Goedhart, Knoors, Westenberg, Treffers, 2012). As a result, hearing impaired children often experience some sort of estrangement with regards to social abilities and associated stigma. For children with hearing impairment, exposure to communication and access to language can be an especially important factor in psychosocial development. According to Statistics South Africa (2012), school attendance among children aged 5 to 6 showed that school attendance was highest among children with no physical difficulty and lowest among those that had severe difficulty in walking, communicating and hearing.

Hearing loss imposes a serious challenge for the overall development of young people (Jaiyeola & Adeyemo, 2018). The school type and socio-economic class have a relationship with the QoL of learners who are hearing impaired while age of onset of hearing loss and

gender showed no significant relationship with QoL. The better QoL found among learners in special schools in the environment and social relationship domains suggests that the "Deaf" community created in the special school provided a form of protection against stigma and discrimination, it also apparently promotes social interactions between learners who are hearing impaired (Jaiyeola & Adeyemo, 2018).

In spite of the many challenges faced by families with children who are hard of hearing, studies have found that some families cope remarkably well (Hartshorne, 2002; Moores, Jatho, & Dunn, 2001). Families who have a child with a disability have less stress, adjust well and cope better when they have social support (Gillard, 2002; Greeff & Van der Walt, 2010; Judge, 1998). Taanila, Syrjälä, Kokkonen and Järvelin (2002) found that families who had children with disabilities relied immensely on the support from formal services. Parents seem to find training courses help them cope and think they are supportive and useful because they are able to exchange experiences and chat to other parents who are in similar circumstances and who have similar experiences (Taanila et al., 2002). Hintermair (2000) found that parents who befriended or became acquainted with other parents with children who are hard of hearing showed a strong sense of competence and had a sincere, trusting and accepting relationship with their children. Morton (2000) found that support from the extended family, especially grandparents, was important in encouraging the development of children with a hearing impairment.

INTERVENTION PROGRAMMES

Motor skill interventions are highly recommended to take place in early childhood, as it is considered the golden age in human development (Draper, Achmat, Forbes, & Lambert,

2012; Logan et al., 2011). Motor control programmes, including eye-hand co-ordination and visual-motor training, balance training and general co-ordination exercises can be useful to maintain gross motor skills and postural control in children with sensorineural hearing loss (Shah et al., 2013).

An American intervention study focusing on the development of fundamental motor skills of children from disadvantaged backgrounds, revealed significant gains in both locomotor and object control skills (Goodway & Branta, 2003). The control group, who had their regular physical activity in their preschool programme, did not make any gains in their locomotor percentile scores. The authors concluded that an absence of motor development specific approaches to the play component could account for this. Goodway and Branta (2003) found better development of fundamental movement skills in children who received an intervention with a direct instruction element compared to those who had experienced a well-equipped playgroup only.

In South Africa, Pienaar, Van Rensburg and Smit (2011) found that an exercise intervention "was effective in significantly improving the children's fine motor, gross motor, perceptual motor and overall motor abilities, as well as significantly improving selected cognitive concepts and attentive and observation skills" (Pienaar et al., 2011, p. 126), which they refer to as the principal fundamentals of the learning process in school.

According to Logan et al. (2011), "motor skill interventions are effective in improving basic and fundamental movement skills in children. Early childhood education centres should implement 'planned' movement programmes as a strategy to promote motor skill development in children" (p. 305). Logan et al. (2011) further emphasized that although

crèches and schools are good arenas for implementation of motor skill development programmes, the quality of the programme will be directly impacted by the quality of the programme implementation, hence sufficient training must be provided to the educators to ensure that the integrity of the programme is not defaulted.

Executive function (EF) is a set of mental skills that help you get things done that are controlled by the frontal lobe of the brain (Bhandari, 2017). Xiong, Zhu, Dong, Wang, Yan, and Chen (2018) established that executive function in hearing impaired children improved considerably after participating in an exercise regimen. A growing body of literature has emerged on the positive effects of aerobic exercise on the brain and EF. Exercise plays a causal role in improving EF, as exercise training improves performance of EF tasks (Chen, Yan, Yin, Pan, & Chang, 2014). A 10-week aerobic exercise programme in primary students with Chinese learning difficulties improved EF performance in the exercise group compared to the control group (Chen, Cui, & Yin, 2016). Another study of children with a hearing impairment found positive effects on working memory and shifting of executive function in preadolescent children with a hearing impairment after an 8-week moderate skipping training programme (Chen et al. 2015). Nevertheless, it remains unclear whether the neural basis of improvement in these children's EF is elicited by exercise intervention.

The cooperation and collaboration between teachers, physical educators, physical therapists and occupational therapists in teaching motor skills for pre-schoolers with developmental delays is of utmost importance as highlighted in research conducted by Murata and Tan (2009). They recommend that when planning motor development programmes, this interdisciplinary group should design activities that first address preschool readiness skills

such as imitation skills, bilateral integration and sequencing skills, and spatial awareness skills – with careful attention and consideration placed on the special needs of the child.

Vestibular, sight, and somatic receptors play a very important role in maintaining balance and children's basic motor skills and balance are closely linked. In the basic motor skills such as sitting, balance develops more slowly in most children who are hearing impaired than in children who are not hearing impaired (Rajendran & Finita 2010). Lewis, Higham and Cherry (1985) reported that participation in a balance and body awareness programme improved balance performance in children with a hearing impairment and Sheng, Ling, Chen, Hsiang and Chuen (2009) also showed that children's hand movement, balance, and ball skills improved after three months of table tennis training. Further, in 2014 both Majlesi et al. established that improved balance in children who are hard of hearing, as a result of training, demonstrated enhanced somatosensory ability. These studies concluded that an exercise programme that enhances somatosensory ability could result in improved balance in children with a hearing impairment.

According to the available data, as many as 30 to 85% of children with severe or profound hearing loss have some degree of vestibular deficit (De Kegel et al., 2010; Del Pino, Femia, & Pérez-Fernández, 2011). This in turn interferes with the many areas of the children's development, including static and dynamic balance reactions, coordination, and the speed of performed movements (Chilosi et al., (2010). Shah et al. (2013) reported that children with hearing impairments have balance and motor deficits that are primarily due to concomitant damage to the vestibular structures. In most children who are hearing impaired, fundamental motor skills, such as the maintenance of head, sitting, and bipedal positions, develop more slowly than in children who are not hearing impaired (Rajendran & Finita, 2010). To master

these skills, a properly developed body schema that is based on perception and experience is essential. Sensations from the skin, proprioceptive information from the muscles and joints, and motion- and gravity-related information from the vestibular system are organized, integrated, and ultimately applied during daily activities. Due to the well-organized perceptions of the body, an individual can feel the actions of any given part of the body, how those parts move, and where those parts are in space. However, when the supply of information from one of the sensory systems is limited, for example, due to the loss of hearing, the feeling of one's body within space may be affected, and result in a reduction of the maturity level of posture control (An, Yi, Jeon, & Park, 2009).

MOTOR ASSESSMENT GUIDES

For the purpose of the current study, the researcher was guided by the Movement Assessment Battery for Children – Second Edition (MABC-2) (Henderson, Sugden, & Barnett, 2007), Bruininks–Oseretsky Test of Motor Proficiency (BOTMP) (Bruininks, 1978), Peabody Developmental Motor Scales (PDMS) (Folio & Fewell, 1983) and Test of Gross Motor Development (TGMD) (Ulrich, 1985) to evaluate possible motor ability improvements.

The MABC – 2 is further discussed in Chapter 3 but a breakdown of the other tests are as follows:

Bruininks–Oseretsky Test of Motor Proficiency (BOTMP)

The BOTMP is a norm-referenced test of both fine and gross motor abilities. Test purposes stated in the manual are screening, evaluation, research, programme planning, and assistance with placement decisions. The BOTMP consists of 46 items that are divided into eight subtests: Running Speed and Agility, Balance, Bilateral Coordination, Strength, Upper Limb

Coordination, Response Speed, Visual Motor Control, and Upper Limb Speed and Dexterity. The BOTMP also includes a short form (BOTMP-SF) which comprises 14 selected items. The number of formal trials for each item is specified. The scoring system varies with each item, ranging from a 2-point (pass/fail) to a 16-point scale. A raw score is recorded in the unit measured (e.g. seconds, number of catches) and then converted to a numerical point score.

Most of the equipment required for testing is included in the BOTMP test kit. Studies have evaluated the reliability and validity of the BOTMP in addition to those described in the manual. Moore, Reeve and Boan (1986) tested 32 children aged 5 years old on the BOTMP-SF. Children were tested on two test dates, one week apart. Although the authors reported a test–retest reliability correlation coefficient for the BOTMP-SF of 0.76, reliability of subtest item scores ranged from 0 to 0.76 with a median coefficient of 0.39. Interestingly, a correlation coefficient of 0 was reported on two occasions for one of the items in the bilateral coordination subtest. An intraclass correlation coefficient (ICC) of 0.87 was reported for BOTMP-SF scores across four test sessions with 13 of the children, indicating consistent performance. Construct validity of the BOTMP has been questioned, as rotated factor analysis loadings do not support the assumed grouping of subtests into gross motor and fine motor sections (Tabatabainia, Ziviani & Maas, 1995). Their results suggest that the items on the BOTMP do not discriminate between fine motor and gross motor abilities. Rather, the BOTMP is a measure of general motor proficiency.

Peabody Developmental Motor Scales (PDMS)

The 1983 version of the PDMS is a standard and norm-referenced scale. The PDMS was developed to establish the developmental skill level of a child, to identify skills that are

undeveloped or are emerging, and then to provide suggestions for programme planning. The authors state that the PDMS can be used as a diagnostic or screening tool for children at risk of motor delays as well as with children with known physical disabilities. The PDMS consists of fine motor and gross motor scales, which can be administered and scored separately. The gross motor scale consists of 170 items, which are divided into 17 age categories. Items in the gross motor scale are divided into five movement skill categories: Reflexes, Balance, Non-locomotor, Locomotor, and Receipt and Propulsion. The test employs a 3- point scoring system with the following scores: 0, if the child cannot or will not attempt the item or the attempt does not show that the skill is emerging; 1 if the performance resembles the item, but does not fully meet the specified criteria; and 2, if the child performs the item according to the criteria in the manual. Item-specific criteria for a score of 1 are not included in the manual. Equipment required for test administration is typically found in most preschool programmes, however a large variety of equipment is required.

Reliability and validity of the PDMS have been evaluated by Schmidt, Westcott and Crowe (1993), who examined the interrater reliability of the gross motor scale of the PDMS with 33 children aged 4 to 5 years. The children were divided into three groups: one group without known delays and two groups with previously identified delays. ICCs between test sessions based on total GM scale scores were reported as 0.84 and 0.93 for the two groups with identified delays and 0.94 for the group without delays. Palisano, Kolobe, Haley, Lowes and Jones (1995) suggest that the gross motor scale of the PDMS can be used as a 'global measure of change in motor development'.

Test of Gross Motor Development (TGMD)

Ulrich (1985) states that the TGMD was developed to assess motor skills, typically taught in physical education, to children aged 3 to 10 years, and to develop a criterion and norm-referenced test that could be used by a wide variety of professionals. It emphasizes components of skill sequence rather than the product of performance. Test purposes stated in the manual are identification and screening, instructional programming, assessment of progress, programme evaluation, and research tool. The TGMD consists of 12 fundamental movement skill items with 3 to 4 observable criteria specified for each movement skill. Criteria are based upon typical movement patterns identified from motor development literature and consensus among content experts. Skills are divided into two subtests: Locomotion and Object Control. The locomotion subtest observes run, gallop, hop, leap, horizontal jump, skip, and slide abilities. The Object Control subtest observes the two-handed strike, stationary bounce, catch, kick, and the overhand throw. The child performs each skill three times and each criterion is given a score of 0 or 1. An item score of 0 is given if the criterion is observed on fewer than two of the three trials. Subtest scores are totalled and converted into standard scores. A study conducted by Aponte, French and Sherrill (1990) found that scores for 5, 6, and 7-year old's increased significantly with age. Table 2.1 depicts an overview of all the administrative considerations for all four tests that the researcher was guided by.

Table 2.2: Administrative considerations for the four reviewed motor development tests (adapted from Wiart & Darra 2001)

	BOTMP (gross motor subtest)	***TGMD***	***MABC-2***	***PDMS (gross motor scale)***
Age (y: m)	4:5–14:5	3:0–10:0	3-16	Birth–6:11
Time to administer (minutes)	Long form 45–60 Short form 15–20	15–20	20-40	
Recommended uses	Not recommended unless age of the child precludes use of other reliable and valid assessment tools	Identification, screening, programme planning, evaluation; research tool for school children suspected of having motor coordination difficulties.	Programme planning, research tool, evaluation of children with motor coordination difficulties	Identification, screening, programme planning, research tool; evaluation for children suspected of having motor coordination difficulties.
Number of items	Long form 20	12	24 (8 tasks in 3 separate age bands)	170 gross motor (10 items at each 17 age levels)
Equipment required	Gym mat, stopwatch, 2 chairs, clipboard, test kit	Masking tape, chalk, traffic cones, 10–15 cm light ball, plastic bat, 20–25cm playground ball, 15–20 cm sponge ball, tennis ball, 20–25 cm plastic or slightly follow deflated playground ball, tape measure	Stopwatch, clipboard, test kit	Masking tape, rattle, stopwatch, string attached stopwatch, string attached with railing, ball, tennis ball, pull toy, table objects (box, chair, table) of different heights, tape measure, tricycle, wall target, mat, two cans or other lightweight objects

CHAPTER SUMMARY

In summary, children learn how to move and become mobile by exploring their environment and adapting to it. Depending on the type of hearing loss, it is not uncommon for children who are hearing impaired to struggle with movement and motor skill development throughout their lives, which in turn can affect various aspects thereof. The development of motor skills is crucial to all children as it provides the fundamental basis of learning, adapting and developing the necessary physical, academic and social skills. Motor skill development is often overlooked in children who are hearing impaired because the development of language and communication is often first priority.

It has been suggested that children need motor skills necessary to participate in physical activity. Regular physical activity is essential for children to reach significant motor milestones and improve their health and wellness, physically, mentally, socially and emotionally. Therefore, providing children with hearing impairment opportunities to take part in physical exercise programmes which utilize motor skills could prove to be beneficial in many ways and should be investigated further. Furthermore, children who are hearing impairment may struggle to connect socially with their parents or guardians and caregivers who are seen during the early stages of development.

Recent research has suggested a relationship between motor skills and social skills in the development of young children, hence, it is imperative that educators and primary caregivers provide children with opportunities to learn and master the necessary gross motor skills to initiate social and communication development. Therefore, the current study used a group intervention programme which allowed children the opportunity to practice motor and social skills.

The next chapter will provide a comprehensive discussion regarding the research methodology of the current study, including descriptions of the subjects, the measurement tools and the intervention programme.

CHAPTER THREE

METHODOLOGY

INTRODUCTION

This chapter gives an outline of research methods that were followed in the study. It provides information on the participants, that is, the criteria for inclusion in the study, who the participants were and how they were sampled. The researcher describes the research design that was chosen for the purpose of this study and the reasons for this choice. The instrument that was used for data collection is also described and the procedures that were followed to carry out this study are included. The researcher also discusses the methods used to analyse the data. Lastly, the ethical issues that were followed in the process are also discussed.

RESEARCH DESIGN

A pre-test, post-test single group design using a quantitative approach was utilised to conduct this study, which evaluated the effectiveness of the exercise intervention programme on motor skill development and quality of life of children aged four to nine, using a researcher-designed motor assessment battery and a health-related quality of life questionnaire.

Studies can be conducted without control groups (Campbell & Stanley, 1963). There are many instances when a control group is not included in an experimental design. Prospective cohort studies are one, in which a group of individuals are tracked longitudinally. Another is observational studies wherein the study does not have an experimental manipulation, but rather

participants are followed in their naturalistic setting, or alternatively, all participants undergo the same experimental protocol.

There was no control group in this study because the sample already formed an existing test group at the selected schools, and all children were included for intervention. Due to ethical considerations and to provide each child with the opportunity to receive the best effective treatment to develop successfully, the group was not divided into an experimental and control group. The researcher chose this study design and method as a means to limit and/or avoid the exclusion of children in the intervention programme and to encourage participation across all the age groups by doing so. The researcher felt that the social engagement, experience and enjoyment of the activities played an equally important role to obtaining results from the study. The two schools at which the study was conducted, was purposefully selected based on them being government-owned with no other funding. Although no definite research was conducted regarding the socioeconomic statuses of the children, it can be assumed that, due to them not attending a so-called Model C/ private school for the hard of hearing in the Cape Town region, that they are from a disadvantaged background. One of the selected schools in this study, also accommodates learners from rural and township areas as well as areas outside of Cape Town by providing hostel accommodation.

POPULATION AND SAMPLING

In the greater Cape Town area there are seven schools that provide education for hard of hearing children. Some of these schools operate privately and some are government owned. There are levels of severity of deafness that some schools will permit, or prohibit to enter their school system. In some instances, learners will undergo several tests before they are permitted

to gain entry or acceptance into a school. Private schools are fortunate to have most necessary remediation and physical therapies such as speech therapy, physiotherapy and occupational therapy at their disposable. Other extracurricular activities such as Monkeynastix® are also readily available. In the government other schools, fewer or none of these therapies or extracurricular activities are available, which is why the researcher chose to focus her study on two purposefully selected government schools in Cape Town.

These schools divide learners into classes based on their level of *function*, not age, therefore learners from grade R to grade 3 were asked to participate in the study. In addition, research has shown that the optimal learning period for the development of fundamental motor skills is between two and seven years of age (Gallahue & Cleland-Donnelly, 2007), which is the category of age that these learners were. The hearing loss of the children was from moderate to profound hearing impairment. These children received pre- and post-intervention testing and participated in a 12-week group-exercise intervention programme.

Inclusion criteria

Children were included in the current study:

- if they were in one of the assigned classes (Grade R – Grade 3),
- if they had been diagnosed with moderate to profound hearing loss according to the WHO criteria for grading hearing loss (Table 2.1) (WHO, 2012),
- if their parents or guardians consented,
- if their parents or guardians had completed the TNO-AZL Preschool Children's Quality of Life questionnaire (TAPQOL) (Fekkes et al., 2004) or the TNO-AZL Child Quality of Life questionnaire (TACQOL) (Vogels, Verrips, Koopman, Theunissen, Fekkes & Kamphuis, 1999).

Exclusion criteria

Children were excluded from the current study if they had any physical injuries preventing them from participating in physical activity, if they chose not to participate in the group intervention programme and/or if their parent/guardian did not provide consent for them to take part in the study.

PROCEDURES

Two assessments were used in the current study, a motor assessment test battery and a health-related quality of life questionnaire. The motor assessment battery of tests was administered both pre- and post-intervention to determine the fine and gross motor proficiency of the children as well as their static and dynamic balance ability. The battery consisted of two age bands: 4–6 years, and 7–9 years.

Parents or guardians completed the TAPQOL and TACQOL questionnaires, which was available in their preferred language, either English, Afrikaans or isiXhosa (Appendix A). The TAPQOL questionnaire was used for children aged 4 – 5 and the TACQOL was used for children aged 6 – 9 years. These were administered pre- and post-intervention to determine the children's HRQoL and to determine if the group intervention programme had an effect on the sub-components.

Tools

For the purpose of the current study, the researcher was guided by the Movement Assessment Battery for Children – Second Edition (MABC-2) (Henderson et al., 2007), Bruininks–Oseretsky Test of Motor Proficiency (BOTMP) (Bruininks, 1978), Peabody Developmental

Motor Scales (PDMS) (Folio & Fewell, 1983) and Test of Gross Motor Development (TGMD) (Ulrich, 1985) to evaluate possible motor ability improvements. More information on these tests is described in chapter two. The motor assessment for the current study, in which some of the MABC-2 testing protocols were adapted, was used to determine whether there was a training effect in the children who participated, caused by the exercise intervention. These tests and protocols are further explained below.

Movement Assessment Battery for Children 2nd edition (MABC-2)

The MABC-2 (Henderson et al., 2007) is a revision of the Movement Assessment Battery for Children (MABC) (Henderson & Sugden, 1992). The revised Test and Checklist make it possible to identify and describe impairments in motor performance of children in the age range of 3–16. The Movement ABC-2 test consists of eight items in each of three age bands (3–6 years; 7–10 years; and 11–16 years). These items measure different aspects of motor ability, which are divided into three major performance areas called components: manual dexterity (three items), aiming and catching (two items), and static and dynamic balance (three items). For all items, besides aiming and catching, two trials are given if needed and the best trial is used to rate the child's performance on the test.

The battery of tests and protocols used for age band 1 (4 - 6 years) in this study were as follows:

Table 3.1: Manual dexterity (age band 1):

Posting Coins Participants placed allocated number of coins into moneybox (ideally, as fast as they could). Each hand was tested 6 coins for 4 year olds 2 coins for 5-6 year olds Scoring: time in seconds to compete the task was taken, with the average of both hands being recorded as the score.	
Threading Beads Participants threaded allocated number of beads onto shoelace (ideally, as fast as they could). 6 beads for 3-4 year olds 12 beads for 5-6 year olds Scoring: time in seconds was recorded.	

Table 3.2: Aiming and catching (age band 1):

Catching beanbag Tester stood two metres away from subjects and proceeded to throw beanbag. Participants were allowed 10 attempts to try to catch the beanbag. Number of catches were counted.		

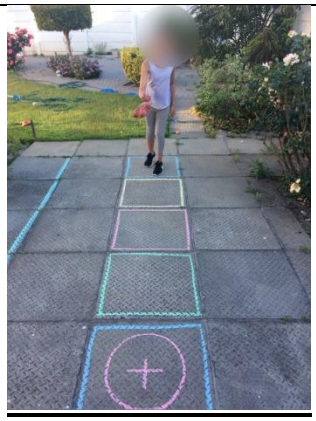
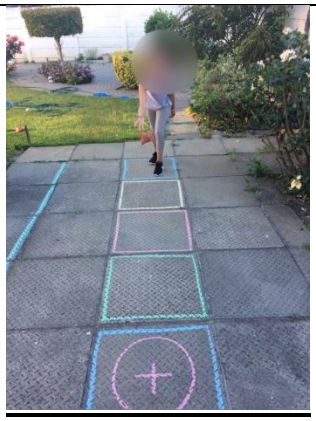
Throwing beanbag onto target Participants stood two meters away from target (last blue square in photograph -see right) and proceeded to throw beanbag onto blue square (target). Participants were allowed 10 attempts to hit the target. Number of hits counted.		

Table 3.3: Static and Dynamic Balance (age band 1):

Stork stand Participants were required to stand on each leg for 30 seconds. Each leg was tested <u>Scoring:</u> 1= if subject stood still without losing balance for 30seconds; 0= if subject lost balanced <30seconds	
Jumping (with both legs) Participants were required to do 5 continuous jumps as shown. Participants – had to finish in a controlled manner. <u>Scoring:</u> Subjects either completed task or not – two trials were allowed	

Walking Heels Raised Participants were required to walk (with heels raised) a 4.5m line drawn onto the ground. Scoring: Participants either completed task or not – two trials were allowed (Maximum score = 15 steps or when child reaches end of line).		

The battery of tests and protocols used for age band 2 (7 - 9 years) in this study were as follows:

Table 3.4: Manual dexterity (age band 2):

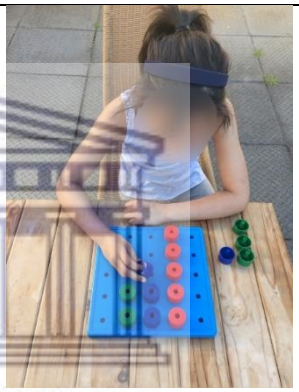
Placing Pegs Participants placed allocated number of pegs into peg board (ideally, as fast as they were able to). Each hand was tested, dominant hand first. 12 pegs for each hand, pegs could be inserted in any order. <u>Scoring</u>: time in seconds to compete the task was taken, with the average of both hands being recorded as the score – two trials allowed.	
Threading lace Participants attempted to thread lace through one line of peg holes as shown, as fast as possible. <u>Scoring:</u> time in seconds was recorded.	

Table 3.5: Aiming and catching (age band 2):

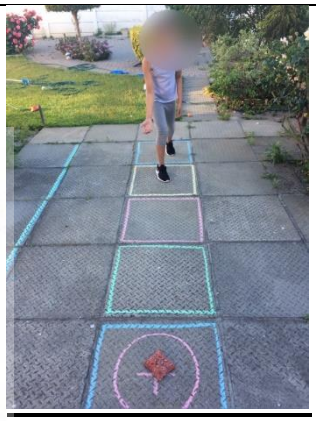
Throwing and Catching Standing 1m away from the wall, participants attempted to throw and catch the ball. The participants had to catch the ball with two hands. The number of catches was counted. (For ages 7-8, ball allowed to bounce once before catching)		
Throwing beanbag Participants stood two meters away from target (red target circle in the last blue square in photograph - see right) and proceeded to throw beanbag onto target. Participants were allowed 10 attempts to hit the target. Number of hits counted.		

Table 3.6: Static and dynamic balance (age band 2):

Stork stand Participants were required to stand on each leg for 30 seconds. Each leg was tested <u>Scoring:</u> 1= if subject stood still without losing balance for 30seconds; 0= if subject lost balanced <30seconds	

Hopping Participants were required to do 5 continuous one-legged hops as shown. Subjects had to finish in a controlled manner. Dominant leg was tested. <u>Scoring:</u> Participants either completed task or not – two trials were allowed	
Walking heel to toe forwards Participants were required to walk forwards (heel to toe) a 4.5m line drawn onto the ground. Scoring: Participants either completed task or not – two trials were allowed (Maximum score = 15 steps or when child reaches end of line).	

The TNO-AZL Preschool Children's Quality of Life questionnaire (TAPQOL)

The TAPQOL measures parent's perceptions of quality of life in preschool children. The TAPQOL was created to enable a systematic, valid and reliable description of Health-related Quality of Life of preschool children (Fekkes et al., 2004). Health Related Consequently, the TAPQOL assesses functional problems, weighted by the degree to which a child shows negative emotions to such problems. The TAPQOL can be used to evaluate the impact of illness and treatments on the different domains of young children's lives, e.g. Physical, Social and Psychological. The questionnaire was developed for children between 9 months and 6 years old.

The TAPQOL cannot reliably be used as an instrument for individual diagnostics, e.g. for individual testing or screening. In a clinical setting, it may be used though to guide communication between physician, parents, and the child itself. It is a multidimensional instrument with 43 items covering 12 scales (Table 3.8). The domains covered by the TAPQOL are based on a review of the literature, discussions with experts (child psychologists, paediatricians, and parents) and statistical testing.

Table 3.7: TAPQOL scales and matching items (Fekkes et al., 2004).

SCALE		**ITEMS**
Stomach Problems	Measures stomach and intestinal problems.	1, 2, 9
Skin Problems	Measures skin problems like eczema, itchiness, and dry skin.	3, 4, 5
Lung Problems	Measures difficulties with breathing, lung problems, bronchitis or shortness of breath.	6, 7, 8
Sleeping Problems	Measures sleeping problems like being awake or crying or difficulty sleeping during the night	10, 11, 12, 13
Appetite	Measures if the child had a bad appetite, difficulty to eat enough of refused to eat.	14, 15, 16
Problem Behaviour	Measures difficult and aggressive behaviour of the child.	17, 18, 19, 20, 21, 22, 23
Positive Mood	Measures positive emotions.	24, 25, 26
Anxiety	Measures if the child was anxious, tense or frightened.	27, 28, 29
Liveliness	Measures if the child was active, lively and energetic.	30, 31, 32
Social Functioning (*Only for children older than 18 months*)	Measures social contacts with other children, like if the child was at ease with other children.	33, 34, 35
Motor Functioning (*Only for children older than 18 months*)	Measures gross motor problems like difficulties with walking, running, climbing stairs and balance.	36, 37, 38, 39
Communication (*Only for children older than 18 months*)	Measures communicative skills of the child when compared to children of the same age.	40, 41, 42, 43

TNO-AZL Child Quality of Life questionnaire (TACQOL)

The TNO-AZL Questionnaires for Children's Health-Related Quality of Life (or TACQOL) were constructed to enable a systematic, valid and reliable description of Health-Related Quality of Life of children with chronic diseases aged 6-15 by the children themselves or their parents. For this current study, a parent/guardian completed the questionnaire.

The TAPQOL and TACQOL questionnaires were completed by the parent/guardian and took approximately 10 minutes to complete. The questionnaire is designed primarily for research purposes focusing mainly on data aggregated on the group level, for example in clinical trials, evaluative or descriptive studies.

The Parent Form TACQOL-PF explicitly asks parents to try to assess their child's feelings with regard to functional problems that their child faces, and not their own feelings ("true proxy").

The TACQOL is a multidimensional instrument, with seven scales (Table 3.9). The domains covered by the TACQOL are based on a review of the literature, discussions with experts (child psychologists, paediatricians) and statistical testing.

Table 3.8. TACQOL scales (Vogels et al.,1999).

LABEL	SCALES
Body	Problems/imitations concerning general physical functioning/complaints
Motor	Problems/limitations concerning motor functioning
Auto	Problems/limitations concerning independent daily functioning
Cognit	Problems/limitations concerning cognitive functioning and school performances
Social	Problems/limitations in social contacts, with parents and peers
Emopos	The occurrence of positive moods
Emoneg	The occurrence of negative moods

INTERVENTION

The intervention-training programme took place over 12 weeks and consisted of motor control activities/games (Appendix B). The motor control activities evolved around activities to stimulate development of dexterity, fine motor skills, ball skills, coordination, spatial awareness and balance (static and dynamic).

The programme was designed by the researcher who recruited and trained research assistants to assist in the study. The intervention was done during school hours at the schools on two days of the week, for an hour for a 12-week period.

STATISTICAL ANALYSIS

The data were analysed using descriptive statistics, in the form of frequencies, means and standard deviations. Inferential statistics in the form of a one-tailed, paired t-test was employed to compare the dependent variables from pre- to post-test. Data were analysed using the MicroSoft-Excel software programme. The level of significance was set at $p<0.05$.

ETHICS STATEMENT

Ethics clearance (Appendix C) was obtained from the University of the Western Cape Biomedical Research Ethics Committee (number 13/9/28) and permission was obtained from the Western Cape Department of Education (Appendix D) in order to approach the schools to conduct the study. The Principals of the schools involved were also approached to gain permission to conduct the research. Parents/guardians, educators as well as the participants were then informed of the study (Appendix E) and its procedures and written consent was requested from the parents/guardians (Appendix F), and assent (Appendix G) from the participants to participate in the research, as they were younger than twelve years of age. The educators were allowed to intervene at any point if they felt the child should not continue with the training or that the study was not being conducted properly. Although both schools were English-medium, all forms and questionnaires were provided in the learners/parents/ guardians language of choice, i.e. English, Afrikaans or isiXhosa. Due to the participants' age range, they may not have been able to read adequately in order to understand the information sheet, hence the researcher ensured that the research project was thoroughly explained to them verbally and that they understood what the study was about. They also were given an opportunity to ask any questions. The parents/guardians and educators were present at this information session to help the children understand the research project, and they were asked

to sign a consent form at this point. The children were asked to sign/append their name to an assent form.

The participants were informed that their participation in the research was purely their choice and that, at any time during the duration of the research, they could stop participating in the research project without any punishment. Similarly, parents/guardians and/or educators were informed that they may withdraw a child from the study at any time, without consequence.

The research took place at an agreed date and time, so it did not interfere with the school programme. Safety was paramount during the exercise programme, and children were monitored by the researcher as well as the teacher at all times. Immediate first aid was available should any injury occur, but this was never required.

It was ensured that the identities and interests of those participants involved were protected by using participant identity (ID) codes rather than names on all forms and questionnaires. The researcher was the only person with access to the list of participant ID codes linked to their names. Participants were assured that they would remain anonymous in any publications emanating from this research. Confidentiality was ensured by keeping all forms in a locked filing cabinet in the researcher's office, and these data will be kept for five years before being destroyed. Electronic data was stored on a password protected computer. The researcher ensured that appropriate training and preparation for conducting the research took place and that all risks were minimized. Data will be kept for a period of 5 years before being destroyed.

CHAPTER FOUR

RESULTS

INTRODUCTION

This chapter provides an overview of the results in accordance with the objectives and hypotheses of the study. Data is organised, analysed and reported to determine whether the researcher's designed exercise intervention had an effect on the motor skill abilities and Quality of Life (QoL) in children who are hearing impaired. The results for the motor assessment battery of tests are presented first, followed by the results for the TNO-AZL preschool children's quality of life (TAPQOL) and the child quality of life (TACQOL) questionnaires.

MOTOR SKILLS

The total number of children (n=30) who participated in this study were split into two age bands for the motor assessment battery testing: Age band 1 consisted of 12 children aged 4-6 years, and age band 2 consisted of 18 children aged 7-9 years. The average age for band 1 was 5.1 ± 0.85 years and was 8.18 ± 0.76 years for age band 2. Each age band completed tests within three domains: Manual Dexterity (MD), Aiming and Catching (AC), and Static and Dynamic Balance (SDB). The hypothesis related to these data was that the exercise intervention would enhance the motor skills ability of children who have hearing impairment (HI).

Age band 1 (4-6 years):

Table 4.1 depicts the test results of the motor assessments conducted pre- and post-intervention for the pre-school children in age band 1. As can be seen, there was no change from pre- to post-intervention in the results for the children in age band 1 relating to the Manual Dexterity (MD) component of the motor assessment battery of tests. However, there

were significant improvements noted in the following components of the motor assessment battery of tests: AC1 Catching a bean bag (p=0.006) and AC2 Throwing a bean bag onto a target (p=0.009), as well as the SDB1 Stork stand test (p=0.025). However, they did not show any significant change in the 'double leg hopping' or in the 'walking with heels raised' tests within the Static and Dynamic Balance component of the motor assessment battery of tests, nor in the Manual Dexterity components.

Table 4.1: Pre- and post-test result of the Motor assessment battery for age band 1 (n=12)

Dependent variable	Pre / Post	Mean	SD	Mean difference	*p*-value
MD 1: Posting coins	Pre Post	42.23 40.29	31.26 33.03	1.94	0.341
MD 2: Threading beads	Pre Post	139.52 160.61	60.75 86.37	-21.1	0.128
AC 1: Catching a bean bag	Pre Post	4.77 6.03	3.26 2.82	-1.26	0.006*
AC 2: Throw bean bag onto target	Pre Post	4.84 6.03	3.23 2.79	-1.19	0.009*
SDB 1: Stork stand	Pre Post	0.00 0.11	0.00 0.31	0.11	0.025*
SDB 2: Double-leg hopping	Pre Post	0.10 0.23	0.30 0.43	0.13	0.080
SDB 3: Walking heels raised	Pre Post	0.39 0.35	0.50 0.49	0.03	0.372

** significant at p<0.05*

KEY: MD = Manual Dexterity; SC = Aiming and Catching; SDB = Static and Dynamic Balance

Age band 2 (7-9 years):

Results of the motor assessments conducted pre- and post- intervention for children in age group 2 are depicted in Table 4.2. There were no changes in the post-intervention results for the Aiming and Catching tests (AC1 and AC2) or Stork Stand (SDB1) balance test in age group 2, unlike that seen in age group 1. However, there were statistically significant (p=0.006) improvements demonstrated in completing the MD1 Placing pegs test for the children in age band 2, as well as in the SDB2 One-leg hopping (p=0.035) and SDB3 Walking heel-to-toe forward (p=0.042) tests. No change was seen in the post-intervention test result for the Threading lace test.

Table 4.2: Pre- and post-test results of the Motor assessment battery for age band 2 (n=18)

Dependent variable	Pre / Post	Mean	SD	Mean difference	*p*-value
MD 1: Placing Pegs	Pre	28.30	6.40	3.59	0.006*
	Post	24.71	6.27		
MD 2: Threading lace	Pre	106.34	37.16	-11.74	0.147
	Post	18.08	60.93		
AC 1: Throwing ball against wall and catching	Pre	8.26	2.58	0.61	0.094
	Post	8.87	1.89		
AC 2: Throwing bean bag onto target	Pre	8.32	2.91	0.53	0.123
	Post	8.84	2.06		
SDB 1: Stork stand	Pre	0.21	0.38	0.12	0.065
	Post	0.33	0.45		
SDB 2: One-leg hopping	Pre	0.50	0.23	0.18	0.035*
	Post	0.32	0.23		
SDB 3: Walking heel-to-toe forward	Pre	0.76	0.43	0.16	0.042*
	Post	0.61	0.05		

** significant at p<0.05*

KEY: MD = Manual Dexterity; SC = Aiming and Catching; SDB = Static and Dynamic Balance

QUALITY OF LIFE (QOL)

Two questionnaires were administered to the parents/guardians of the children, depending on their child's age. The TAPQOL questionnaire was administered to the parents/guardians of children aged 4-5 years and the TACQOL questionnaire was administered to the parents/guardians of children aged 6-9 years. In both questionnaires, the following domains are covered by specific scales: Body (assessing the emotional impact of physical complaints), Motor (motoric functioning), Autonomy, Cognition, Social (interaction with parents/guardians and peers). Two scales covering general mood are also included: 'Positive Emotions' and 'Negative Emotions'. The hypothesis related to these data was that parents/guardians would notice the positive effects of the intervention on the QoL of their children.

TNO-AZL Pre-school Children's Quality of Life Questionnaire (TAPQOL)

The TAPQOL questionnaire was completed by the parents/guardians' (n=12) of the children aged 4-5 years (age group 1). Table 4.3 depicts the average of the parents/guardians' answers to the questions that were asked both pre- and post- intervention. As can be seen in Table 4.3, the parents/guardians of the children who completed the intervention felt that their child displayed a significant change in both 'Cognitive' abilities (p=0.022) and 'Positive Emotions' (p=0.016) domains.

Figure 4.1 shows the significant changes (in percentage) from pre- to post-intervention for the 'Positive Emotions' and 'Cognitive' domains of the TAPQOL questionnaires. Notably, there was a 2.2% decrease in 'Cognitive' and 3.2% increase in 'Positive Emotions' and, although these changes are small, they are statistically significant.

Table 4.3: Pre- and post-intervention results for the TAPQOL questionnaire domains

Domain	Pre / Post	Mean	SD	Mean difference	*p*-value
Body	Pre	1.44	0.66	0.01	0.418
	Post	1.44	0.63		
Motor	Pre	1.46	0.58	0.04	0.161
	Post	1.42	0.54		
Autonomy	Pre	2.06	0.80	0.06	0.079
	Post	2.11	0.83		
Cognitive	Pre	1.75	0.79	0.08	0.022 *
	Post	1.67	0.81		
Social	Pre	2.46	0.70	0.02	0.265
	Post	2.44	0.68		
Positive Emotions	Pre	2.42	0.60	0.17	0.016 *
	Post	2.58	0.50		
Negative Emotions	Pre	1.66	0.69	0.02	0.320
	Post	1.64	0.62		

** significant at p<0.05*

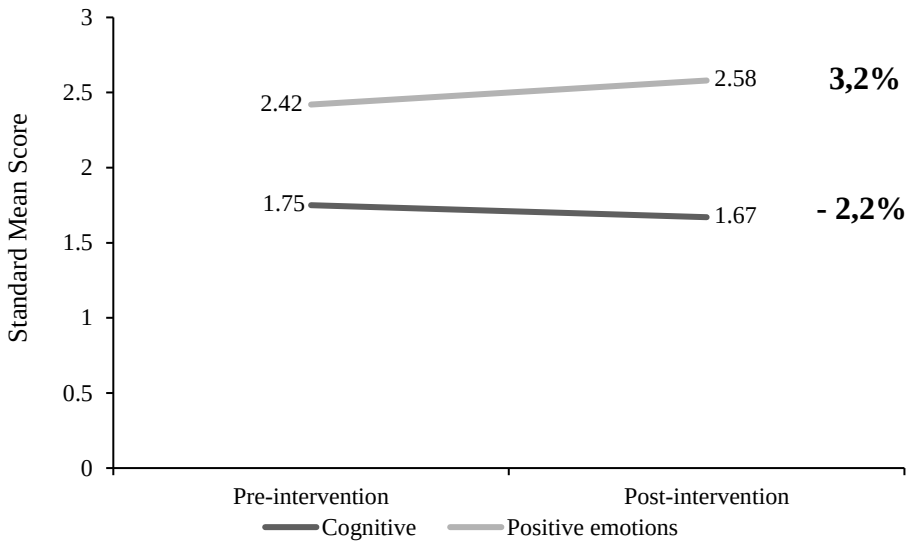


Figure 4.1: Percent change in standard mean scores of significant TAPQOL results

Body Domain

Although there were significant changes noted in Table 4.3 of the TAPQOL 'Body' domain, 2 (17%) more parents/guardians felt that their child *never* experienced a 'stomach ache or abdominal pain' after the intervention (Table 4.4, question 1). From the table, it appears that these 2 parents/guardians changed their answer from to *occasionally* to *never.* This is a positive outcome, as any reduction in stomach ache or abdominal pain is a beneficial more than not to one's health and ultimately QoL.

Table 4.4: Pre- and post-intervention frequencies for TAPQOL 'Body' domain

Body (n=12)	Never		Occasionally		Often	
	Pre	Post	Pre	Post	Pre	Post
Q1: Stomach ache or abdominal pain	**4**	**6**	7	5	1	1
Q2: Colic	10	9	2	3	0	0
Q3: Nausea	10	10	1	1	1	1
Q4: Eczema	10	9	1	2	1	1
Q5: Itching	4	4	6	6	2	2
Q6: Dry skin	7	7	1	3	4	2
Q7: Bronchitis	8	9	3	3	1	0
Q8: Difficulty breathing or lung problems	9	7	3	5	0	0
Q9: Shortness of breath	9	7	3	4	0	1

Motor and Autonomy Domains

There were no noteworthy differences between the pre- post-test results for the 'Motor' and 'Autonomy' domains within the TAPQOL (Table 4.5 and Table 4.6).

Table 4.5: Pre- and post-intervention frequencies for TAPQOL 'Motor' domain

Motor (n=12)	Never		Occasionally		Often	
	Pre	Post	Pre	Post	Pre	Post
Q1: Difficulty walking?	7	7	4	5	1	0
Q2: Difficulty running?	9	9	3	2	0	1
Q3: Difficulty climbing stairs without help?	7	8	5	4	0	0
Q4: Difficulty keeping balance?	5	5	6	7	1	0

Table 4.6: Pre- and post-intervention frequencies for TAPQOL 'Autonomy' domain

Autonomy (n=12)	Never		Occasionally		Often	
	Pre	Post	Pre	Post	Pre	Post
Q1: Did your child have a poor appetite?	6	6	4	3	2	3
Q2: Did your child have difficulty eating enough?	7	6	4	5	1	1
Q3: Did your child refuse to eat?	4	4	7	7	1	1
Q4: Energetic	2	3	3	1	7	8
Q5: Active	0	0	3	2	9	10
Q6: Lively	2	2	5	4	5	6

Cognitive Domain

There was a significant improvement (p=0.022) in the children's cognitive ability (Table 4.3), which is reflected in the fact that 2 (17%) more parents/guardians stated that their child *never* experienced 'lying awake at night' after the intervention was complete (Table 4.7, question 2).

Table 4.7: Pre- and post-intervention frequencies for TAPQOL 'Cognitive' domain

Cognitive (n=12)	Never		Occasionally		Often	
	Pre	Post	Pre	Post	Pre	Post
Q1: Did your child sleep restlessly?	5	6	4	3	3	3
Q2**: Did your child lie awake at night?**	**6**	**8**	5	3	1	1
Q3: Did your child cry during the night?	6	6	3	3	3	3
Q4: Did your child have trouble sleeping during the night?	5	6	4	3	3	3

Social Domain

There was no significant change from pre- to post-intervention results for the TAPQOL for this domain. Data for the questions within this domain are presented in Table 4.8.

Table 4.8: Pre- and post-intervention frequencies for TAPQOL 'Social' domain

Social (n=12)	Never		Occasionally		Often	
	Pre	Post	Pre	Post	Pre	Post
Q1: My child was able to play nicely with other children	0	0	2	3	10	9
Q2: My child was at ease with other children	1	0	2	3	9	9
Q3: My child was self-assured with other children	1	1	1	2	10	9
Q4: Difficulty understanding what others were saying?	0	0	8	9	4	3
Q5: Difficulty talking clearly?	1	1	4	4	7	7
Q6: Difficulty expressing himself/herself?	2	3	5	4	5	5
Q7: Difficulty explaining what he/she wants?	5	4	3	4	4	4

Positive Emotions Domain

There was a statistically significant change in the 'Positive Emotions' domain (Table 4.3) and the data per question for this domain is presented in Table 4.9. To substantiate this, 2 (17%) more parents/guardians stated that their child *often* displayed a 'Content' (positive) emotion post-intervention (question 2).

Table 4.9: Pre- and post-intervention frequencies for TAPQOL 'Positive Emotions' domain

Positive Emotions	Never		Occasionally		Often	
(n=12)	Pre	Post	Pre	Post	Pre	Post
Q1: Cheerful	0	0	7	6	5	6
Q2: **Content**	2	0	6	6	**4**	**6**
Q3: Happy	0	0	4	3	8	9

Negative Emotions Domain

Although there was no statistical significance noted in the 'Negative Emotions' domain as a whole (Table 4.3), there were positive results from in the individual questions. In question 1 'My child was short tempered', 2 (17%) less parents/guardians felt that their child *often* experienced temper tantrums or problems post-intervention. Similarly, 2 (17%) less parents/guardians felt that their child was *never* 'fussy or irritated' (question 3).

Table 4.10: Pre- and post-intervention frequencies for TAPQOL 'Negative Emotions' domain

Negative Emotions (n=12)	Never		Occasionally		Often	
	Pre	Post	Pre	Post	Pre	Post
Q1: My child was short tempered	3	2	5	8	**4**	**2**
Q2: My child was aggressive	4	3	8	9	0	0
Q3: My child was fussy, irritated	**4**	**2**	5	7	3	3
Q4: My child was angry	2	2	8	9	2	1
Q5: My child was restless or impatient with me	4	4	6	7	2	1
Q6: My child was rebellious or defiant with me	6	7	5	5	1	0
Q7: I could not manage my child	7	7	3	4	2	1
Q8: Fearful	8	7	3	4	1	1
Q9: Tense	9	8	3	4	0	0
Q10: Worried	9	10	3	2	0	0

TNO-AZL Child Quality of Life Questionnaire (TACQOL)

The TACQOL questionnaire was administered to the parents/guardians of children (n = 18) aged 6-9 years (age group 2). Table 4.11 depicts the average of the parents/guardians' answers to the questions that were asked both pre- and post- intervention. As can be seen, the parents/guardians of the children who completed the intervention felt that their child displayed a significant change in both the 'Body' (p=0.009) and 'Cognitive' (p=0.012) domains.

Table 4.11: Pre- and post-intervention results for the TACQOL questionnaire domains

Domain	Pre /post	Mean	SD	Mean difference	*p* value
Body	Pre	1.40	0.52	0.10	0.009 *
	Post	1.30	0.49		
Motor	Pre	1.08	0.28	-0.03	0.126
	Post	1.12	0.38		
Autonomy	Pre	1.24	0.55	-0.03	0.234
	Post	1.27	0.58		
Cognitive	Pre	1.78	0.70	0.13	0.012 *
	Post	1.66	0.70		
Social	Pre	2.33	0.81	-0.06	0.109
	Post	2.39	0.81		
Positive Emotions	Pre	2.55	0.54	0.03	0.247
	Post	2.51	0.60		
Negative Emotions	Pre	1.65	0.65	0.10	0.070
	Post	1.74	0.73		

* *significant at p<0.05*

Figure 4.2 below depicts the significant changes (in percentages) from pre- to post-intervention for the 'Body' and 'Cognitive' domains of the TACQOL questionnaire. There was a 4% decrease in both domains which is a positive outcome.

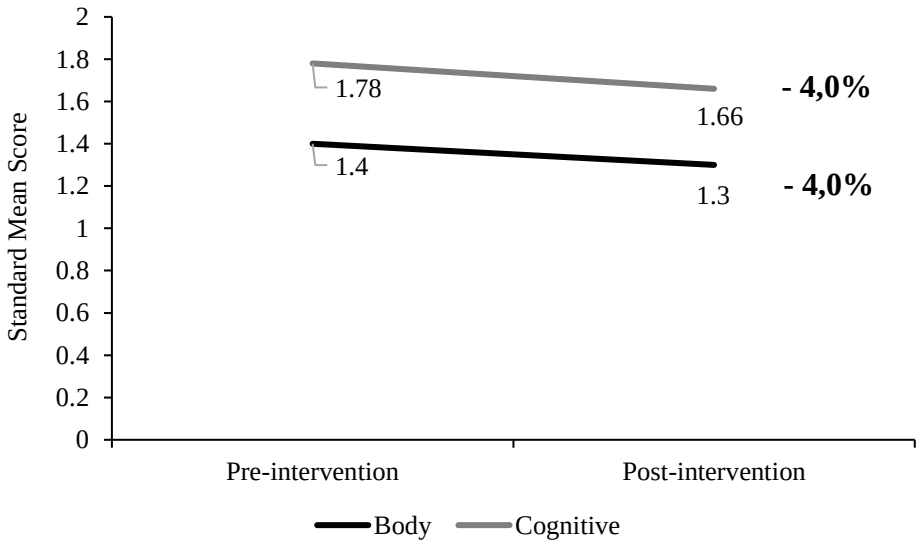


Figure 4.2: Percent change in standard mean scores of significant TACQOL results

Body Domain

For the 'Body' domain, out of the 18 parents/guardians, 2 (11%) more parents/guardians stated that their child *never* suffered from 'earaches or sore throats' post-intervention (question 1). Five (28%) more stated that their child *never* experienced 'stomach-aches or abdominal pain' post-intervention (question 2). This is the largest improvement that was noted in this domain. Similarly, 4 (22%) more parents/guardians stated that their child *never* suffered from 'pain or other symptoms' post-intervention (question 9).

Three (17%) more parents/guardians stated that their child *never* felt 'sick or nauseous' post-intervention (question 5). Likewise, 3 (17%) more parents/guardians stated that their child *never* felt sleepy (question 7). Lastly, 2 (11%) less parents/guardians stated that their child was *never* dozy or lethargic post-intervention resulting in an improvement (a decline) from 89% to 77% of children who *never* felt dozy or lethargic.

Table 4.12: Pre and post-intervention frequencies for TACQOL 'Body' domain

Body (n=18)	Never		Occasionally		Often	
	Pre	Post	Pre	Post	Pre	Post
Q1: Has your child had earaches or sore throats?	**10**	**12**	6	5	2	1
Q2: Has your child had stomach-aches or abdominal pain?	**10**	**15**	8	3	0	0
Q3: Has your child had headaches?	11	12	7	6	0	0
Q4: Has your child been dizzy?	16	17	2	1	0	0
Q5: Has your child felt sick or nauseous?	**9**	**12**	9	6	0	0
Q6: Was your child tired?	9	8	9	10	0	0
Q7: Was your child sleepy?	**7**	**10**	11	7	0	1
Q8: Was your child dozy or lethargic?	**16**	**14**	2	4	0	0
Q9: Did your child suffer from pain or other symptoms?	**11**	**15**	7	3	0	0

Motor Domain

Although there were no statistically significant differences noted in the 'Motor' domain, there was an improvement post-intervention in question 8: 'Difficulty with doing things handily or quickly' (Table 4.13). It can be seen that 2 (11%) of the parents/guardians amended their answer post-intervention to state that that their child *occasionally* experienced 'difficulty with doing things handily or quickly'. This is important to note because this suggests that the intervention had a positive effect on this particular motor ability.

Table 4.13: Pre and post-intervention frequencies for TACQOL 'Motor' domain

Motor (n=18)	Never		Occasionally		Often	
	Pre	Post	Pre	Post	Pre	Post
Q1: Difficulty with running?	18	17	0	1	0	0
Q2: Difficulty with walking?	18	18	0	0	0	0
Q3: Difficulty with standing?	18	18	0	0	0	0
Q4: Difficulty walking downstairs?	17	16	1	2	0	0
Q5: Difficulty with playing?	17	18	1	0	0	0
Q6: Difficulty with running or walking for long periods, with stamina?	16	15	2	2	0	1
Q7: Difficulty with balance?	16	15	2	2	0	1
Q8: **Difficulty with doing things handily or quickly?**	12	13	**6**	**4**	0	1

Autonomy Domain

No statistical significance was noted in the 'Autonomy' domain, however, 3 less parents/guardians stated that their child *never* had 'difficulty going to the lavatory on his/her own' after the intervention (question 4). In addition, 2 (11%) more parents/guardians felt that their child *never* experienced 'difficulty with riding a bicycle' (question 8).

Table 4.14: Pre and post-intervention frequencies for TACQOL 'Autonomy' domain

Autonomy (n=18)	Never		Occasionally		Often	
	Pre	Post	Pre	Post	Pre	Post
Q1: Difficulty with going to school on his/her own?	14	14	1	1	3	3
Q2: Difficulty washing himself/herself?	13	12	3	5	2	1
Q3: Difficulty getting dressed on his/her own?	13	13	4	3	1	2
Q4: Difficulty going to the lavatory on his/her own?	**17**	**14**	1	4	0	0
Q5: Difficulty with eating or drinking on his/her own?	18	17	0	0	0	1
Q6: Difficulty with sports or going out to play on his/her own?	18	17	0	0	0	1
Q7: Difficulty with doing hobbies on his/her own?	15	15	3	3	0	0
Q8: Difficulty with riding a bicycle?	**11**	**13**	4	3	3	2

Cognitive Domain

In terms of the significant change (p=0.012) in the 'Cognitive' domain of the TACQOL, parents/guardians felt that there was an improvement in 6 of the 8 questions asked (Table 4.15). Three (16%) more parents/guardians stated that their child *never* experienced 'difficulty understanding what others said' post-intervention (question 3). Similarly, three (17%) more parents/guardians stated that their child *never* experienced 'difficulty with arithmetic' post-intervention (question 4). In terms of reading ability (question 5), the number of parents/guardians who felt that their child often had 'difficulty with reading' decreased from 6 (33%) to 2 (11%). This resulted in 3 (17%) more parents/guardians stating that their

child *occasionally* as opposed to *often* had ‘difficulty in reading’ post-intervention. In addition, 2 (11%) more parents/guardians stated that their child *never* experienced ‘difficulty with writing’ (question 6), ‘learning’ (question 7) and in ‘saying what he/she meant’ (question 8) after the intervention.

Table 4.15: Pre and Post intervention frequencies for TACQOL 'Cognitive' domain

Cognitive (n=18)	Never		Occasionally		Often	
	Pre	Post	Pre	Post	Pre	Post
Q1: Difficulty with paying attention, concentrating?	9	9	7	6	2	3
Q2: Difficulty understanding schoolwork?	6	7	10	7	2	4
Q3: Difficulty understanding what others said?	**5**	**8**	11	10	2	0
Q4: Difficulty with arithmetic?	**9**	**12**	8	4	1	2
Q5: Difficulty with reading?	6	7	6	9	**6**	**2**
Q6: Difficulty with writing?	**7**	**9**	9	7	2	2
Q7: Difficulty with learning?	**6**	**8**	9	7	3	3
Q8: Difficulty in saying what he/she meant?	**6**	**8**	7	7	5	3

Social Domain

There was no significant change noted in this domain, however, three (17%) more parents/guardians noted that their child was *often* ‘able to play or talk happily with other children’ post-intervention (Table 4.16, question 1). For question 5 ‘My child was able to play or talk happily with us – the parent(s)’, 2 (11%) more parents/guardians stated that their child was *often* ‘able to play or talk happily with them’ post-intervention. It is also important

to highlight that there was also a 11% increase in ‘restlessness or impatience’ (question 7) and ‘defiance’ (question 8) seen in the behaviour of the children towards their parents/guardians after the intervention.

Table 4.16: Pre and post-intervention frequencies for TACQOL 'Social' domain

Social (n=18)	Never		Occasionally		Often	
	Pre	Post	Pre	Post	Pre	Post
Q1: **My child was able to play or talk happily with other children**.	0	0	5	2	**13**	**16**
Q2: My child was able to stand up for himself/herself with other children.	1	0	1	4	16	14
Q3: Other children asked my child to play with them.	0	0	2	2	16	16
Q4: My child was at ease with other children.	0	0	2	1	16	17
Q5: **My child was able to play or talk happily with us - the parent(s).**	0	0	6	4	**12**	**14**
Q6: My child was incommunicative or quiet with us - the parent(s)	12	11	4	5	2	2
Q7: **My child was restless or impatient with us - the parent(s)**	9	10	7	4	**2**	**4**
Q8: **My child was defiant with us - the parent(s)**	9	9	8	6	**1**	**3**

Positive Emotions

No statistical significance was noted in the ‘Positive Emotions’ domain, yet 3 (17%) more parents/guardians noted that their child felt ‘contented’ post-intervention (question 3). However, for the same question it can also be noted that there was a 17% increase in parents/guardians who felt that their child *never* experienced being ‘contented’.

Table 4.17: Pre and post-intervention frequencies for TACQOL 'Positive Emotions' domain

Positive Emotions (n=18)	Never		Occasionally		Often	
	Pre	Post	Pre	Post	Pre	Post
Q1: Joyful	1	0	5	6	12	12
Q2: In good spirits	0	1	5	6	13	11
Q3: Contented	**1**	**4**	15	9	**2**	**5**
Q4: Enthusiastic	0	2	8	6	10	10
Q5: Relaxed	1	1	8	8	9	9
Q6: Happy	0	0	4	5	14	13
Q7: Confident	0	0	7	8	11	10
Q8: Cheerful	0	0	7	6	11	12

Negative Emotions Domain

There was no statistical significance noted in the 'Negative Emotions' domain, however, for question 3 there were 2 (11%) less parents/guardians who answered that their child *never* felt 'worried' (question 3), 'aggressive' (question 5) and 'jealous' (question 7) post-intervention. It is noteworthy to mention that although this is perceived as a negative outcome, 3 more parents/guardians stated that they felt that their child was *often* 'short-tempered' (question 6) after the intervention.

Table 4.18: Pre and post-intervention frequencies for TACQOL 'Negative Emotions' domain

Negative Emotions (n=18)	Never		Occasionally		Often	
	Pre	Post	Pre	Post	Pre	Post
Q1: Sad	7	8	11	9	0	1
Q2: Angry	7	7	9	8	2	3
Q3: **Worried**	**12**	**10**	6	7	0	1
Q4: Gloomy	7	7	8	7	3	4
Q5: **Aggressive**	**10**	**8**	5	7	3	3
Q6: **Short-tempered**	10	9	7	5	**1**	**4**
Q7: **Jealous**	**6**	**4**	8	9	4	5
Q8: Anxious	6	8	11	7	1	3

SUMMARY OF MAIN FINDINGS

Motor skills

The children in age band 2 showed an improvement in the fine motor task of placing pegs after the group intervention programme, despite no significant difference being shown in the Manual Dexterity domain. This indicates that the children took less time to complete the task after the intervention was compete.

There were significant improvements in both Aiming and Catching tests (AC: 1 Catching a bean bag and AC: 2 Throwing onto a target) observed for Age Band 1. However, there were no significant changes for Age Band 2. Also, a statistically significant difference was reported over time, between the pre- and post-intervention test results for the Stork (static) Stand (SDB: 1) in Age Band 1. On the contrary, Age Band 2 showed a statistically significant change in the dynamic aspect of balance. These positive results were reflected in the post-

intervention scores for the One-leg Hop (SDB: 2) test and the Walking Heel-to-Toe forward (SDB: 3) test.

Quality of life

TAPQOL questionnaire

Statistically significant improvements were seen in the 'Cognitive' (p=0.022) and 'Positive (p=0.016) Emotions' domains of the TAPQOL questionnaires which were administered to the parents/guardians of children, aged four to five.

TACQOL questionnaire

Statistically significant findings were seen in the 'Cognitive' (p=0.012) and 'Body' (p=0.009) domains of the TACQOL questionnaires, which were administered to the parents/guardians of children, aged six to nine.

Chapter 5 will discuss the above findings, draw conclusions, discuss the limitations of the current study and provide future recommendations.

CHAPTER FIVE

DISCUSSION, CONCLUSIONS AND RECOMMENDATIONS

INTRODUCTION

In this chapter, the results are critically evaluated and discussed, according to the hypotheses set out in Chapter 1. This is followed by the conclusions, recommendations for future research and study limitations. The focus of this study was to implement a self-designed 12-week exercise intervention programme to determine if there would be a positive effect on the motor skill development and quality of life of children who are hard of hearing in Grade R to Grade 2 at two schools for children who are hard of hearing within the Cape Town region.

DISCUSSION

The findings of the current study were used to evaluate the following hypotheses:

Hypothesis 1:

"The exercise intervention would enhance the motor skills ability of children who have hearing impairment (HI)".

The fundamental motor skills consist of stability skills such as static and dynamic balance, object control skills (catching, throwing, object manipulation with hands and feet) and locomotor skills (running, jumping and moving your body through space) (Payne & Isaacs, 2008:202). Children with hearing deficits typically have delayed motor development (Shall, 2010), due to the lack of auditory input (Savelsbergh et al., 1991). The present literature suggests that the sensitive learning period for the development of fundamental motor skills is between two and seven years of age (Gallahue & Cleland-Donnelly, 2007). Fundamental motor skills that develop during the rudimentary phase, from age 1-2 years, continue to

develop as the child grows older and matures (Gallahue et al., 2003). These motor skills can be developed into sport specific skills as soon as they meet all the criteria of the mature phase of fundamental motor skill development, which is around 6-7 years. The development of mature movement patterns, forms the basis of all sport skills. Therefore, if movement patterns have not developed to a mature stage, the ability to develop specialised movement skills later in life will be inhibited. Game-based activities and exercises will consequently positively contribute to the development of these fundamental motor skills (Akbari, Abdoli, Shafizadeh, Khalaji., Hajihosseini, Ziaee, 2008).

Therefore, the purpose of this study was to assess motor skill proficiency before and after a 12-week exercise programme that consisted of a motor assessment battery of tests to evaluate the following aspects of motor skills:

1. Manual Dexterity
2. Aiming and Catching i.e. ball skills, precision
3. Static and Dynamic Balance

According to the statistical analyses, as presented in Chapter 4, the study findings partially support the first hypothesis. The results indicated that the exercise intervention programme did in fact elicit significant changes in some of the motor abilities of the children who are hard of hearing. The results for each aspect of motor skills evaluated will now be discussed in more detail.

Manual Dexterity (MD)

Manual dexterity, a fine motor skill, is the ability to use your hands in a skilful, coordinated way to grasp and manipulate objects and demonstrate small, precise movements

(Ranganathan, Siemionow, Sahgal, Liu & Yue, 2001). Chan (2000) defines manual dexterity as the ability to manipulate objects and tools with the hands and fingers. Manual dexterity can be further sub-divided into both gross and fine manual dexterity (Desrosiers, Hebert, Bravo, & Dutil, 1995). Gross manual dexterity is related to less precise tasks with the hands. Fine manual dexterity is related to more precise manipulations with the fingers. Many children who are hearing impaired experience communication and language disorders (Sherrill, 1998), which may directly impact the development of specific motor skills. Hearing impaired children tend not to perform as well on both manual dexterity and ball skill abilities (De Kegel et al., 2012).

In Chapter 4, it was stated that there was no significant improvement in manual dexterity as a whole for the children in age band 1 (4-6 years). However, the children in age band 2 (7-9 years) did show significant improvements (p=0.006) in the fine motor task of 'Placing Pegs' after the group intervention programme. This result is supported by several studies that have shown that motor skill interventions and development programmes positively affect fine motor skills (Goodway & Branta, 2003; Pienaar et al., 2011). In contrast, Estil, Whiting, Sigmundsson, and Ingvaldsen (2003) concluded that, where motor and language impairments are present, motor deficiencies may be restricted to a small number of fine motor skills. Their study showed that these children had problems with manual dexterity items such as bimanual coordination and eye-hand coordination, but not with ball skills.

This is further supported by Horn, Pisoni, and Miyamoto (2006), who concluded that the impact of hearing impairment, and its associated language problems, on the development of fine motor skills could be different from gross motor skills. They suggested that fine and gross motor development in children with HI are actually not associated. In their study, gross

motor skills (i.e. skills relating to static and dynamic balance, postural control, and walking, for example "rolling a ball while sitting") as well as fine motor skills (i.e. skills relating to manual behaviours, for example "cutting paper along a line with scissors") were measured. It appeared that fine motor skills, in contrast to gross motor skills, tend to lag behind as children who are hard of hearing grow older. To summarise, based on the findings of Horn et al. (2006), it appears that the intervention in fact had a positive effect on the older group as there was a marked improvement in overall results post intervention.

Aiming and Catching (AC)

Aiming and catching skills form part of 'object control' which underpins the essential fundamental motor skills. Object control refers to skills such as throwing, kicking, and catching a ball, and movements such as walking, running, and hopping (Weikart, 1998). Studies examining the motor skills in children who are hearing impaired have reported deficits in balance, general coordination, visual-motor skills, and ball catching abilities. (Savelsbergh et al., 1991; Siegel, Marchetti, & Tecklin, 1991; Wiegersma & Van der Velde, 1983).

In this study there were significant improvements in the Aiming and Catching tests in the motor assessment battery post-intervention. For Catching a bean bag and Throwing onto a target, significant changes (p=0.01 for both variables) were observed for children in age band 1 (4-6 years). Thus, their hand-eye coordination, aiming, and catching motor skills improved post-intervention. These findings are supported by Sheng et al. (2009) who showed that children's hand movement, balance and ball skills can be improved by three months of table tennis training. There were no significant findings post-intervention for age band 2. Ball skills (like aiming and catching) require adequate postural control (De Kegel et al., 2012)

and, because age band 2 (as discussed below) showed no improvement in static balance, it can be deduced that the association could have resulted in the negative outcome. This is further explained and substantiated in the section below on *Static and Dynamic Balance (SDB).*

Static and Dynamic Balance (SDB)

Postural control is a necessary condition for effective motor control. The critical period of postural control development is between 4 and 6 years of age and of motor development is 8 years (Woollacott, Debu & Mowatt, 1987; Woollacott, & Shumway-Cook, 1990). Balance and motor impairments are associated with hearing impairment and it has been reported that there is a progressive motor deficiency in children with sensorineural hearing loss (Rajendran, Roy & Jeevanantham, 2011; Rine et al., 2000). In the current study, a statistically significant difference was reported over time, between the pre- and post-intervention test results for the (static) SDB 1: Stork Stand (p=0.03) for children aged four to six in age band 1. Several studies support that motor skill intervention and development programmes positively contributed to components of motor control in gross motor skills such as balance and resulted in improved balance skills in children with hearing impairment (Lewis et al.,1985; Majlesi et al., 2014; Goodway & Branta, 2003; Pienaar et al., 2011).

However, in age band 2, no significant difference was seen in static balance between the pre- and post-intervention test results. By age 6-7, children should have reached the 'maturation' developmental milestone of the fundamental motor skills, which indicates that the skills during this phase are characterised as well-coordinated, mechanically correct and as having a smooth/flowing execution (Gallahue et al., 2007). Therefore, by the age of 7-9 years, a child would be expected to have acquired the skills of catching and balancing. However, as

suggested by Martin, Rudisill and Hastie (2009), it is important to recognize that some children do not acquire fundamental motor skills as a result of the maturation process, but rather through a teacher's instruction and by practicing the skill. Hence, intervention to address these deficits should be provided at the primary school age level (Shumway-Cook & Woollacott, 1995).

A significant change was seen in the dynamic balance test results for children in age band 2 (7-9 years). There was an improvement in one leg hopping (p= 0.035) and walking heel-to-toe forward (p=0.042) for this group post-intervention. Rajendran, Roy and Jeevanantham (2013) suggested that exercise programmes to improve the visual-motor and somatosensory skills are more effective in improving the vestibular related deficits in children with hearing impairment.

However, no significant difference was seen between the pre-and post-intervention test results for the Stork Stand test in these children. This outcome is supported by a study conducted by Effgen (1981) who investigated the effect of a 10-day exercise programme of static balance activities on the static balance ability of severely children with a hearing impairment and found no significant difference in static balance ability. These findings are not unexpected as, according to Gallahue et al., (2007), this developmental milestone should be 'mastered' by the age of 7-9 years and, due to this, no further improvements would then be noted. However, in children with a hearing impairment, who generally display delayed motor skills development, one may well expect to have seen an improvement in balancing.

Thus, the majority of findings of this study are consistent with previous research and may prove useful to parents, guardians, caregivers, clinicians, and educators working with

children and youth who are hearing impaired. Understanding barriers and enablers of communication and QoL is critical to both clinical and educational decision-making and the results of the current study can be used to improve support provided to children who are hearing impaired in school and social settings.

Hypothesis 2:

"Parents/guardians would notice the positive effects of the intervention on the QoL of their children".

Quality of Life

The TNO-AZL Preschool children Quality of Life (TAPQOL) and Children Quality of Life (TACQOL) questionnaires were designed and developed to measure health-related QoL in preschool children, from a parent's perspective. Both questionnaires cover the physical, social, cognitive, and emotional functioning domains, however the TAPQOL questionnaire focusses on children aged 1-5 and the TACQOL focusses on children aged 6-9 years.

Overall, statistically significant findings were seen in the 'Cognitive' (p=0.022) and 'Positive (p=0.016) emotions' domains of the TAPQOL questionnaire which was administered to the parents/guardians of children aged four to five. This means that there was improvement seen in these children's cognition and experience of positive emotion post exercise intervention. For the TACQOL questionnaire, which was administered to the parents/guardians of children aged six to nine, statistically significant findings were seen in the 'Cognitive' (p=0.012) and 'Body' (p=0.009) domains, indicating an improvement was seen in these children's cognition and physical well-being.

Body Domain

Hearing impaired children are often known or expected to be frustrated, mainly due to the inability to communicate effectively (Spencer, Erting, & Marschark, 2000). Feelings of unease, such as stomach aches, nausea, headaches and pain, can occur as a result of worry or anxiety as well. Exercise releases endorphins which alleviates stress symptoms and consequently after exercising you may feel a sense of accomplishment and your muscles will relax deeper because of the workout – easing tension and strain. (Stibich, 2018)

More parents/guardians felt that their children (4-6 years old) suffered less painful symptoms such as stomach aches or felt sick or nauseous. Similar results were noted for the 7-9-year olds, with their parents/guardians stating that they too had less painful conditions, earaches or sore-throats'. In other words, the intervention seemed to reduce the amount of pain these children felt, which reflects an increased quality of life.

In addition, more parents/guardians stated that their child (4-6 years old) never felt sleepy, dozy or lethargic post-intervention. Although sleep and exercise exert substantial positive effects on one another (Brett, Dolezal, Neufeld, Boland, Martin & Cooper, 2017), it can also promote a feeling of euphoria and a new-found sense of energy, especially in those who have previously been sedentary (Stibich, 2018).

Motor Domain

Motor deficits are common and almost inevitable in children who are hearing impaired. Lieberman et al., (2004) stressed that environmental factors like type of schooling and parental involvement in physical activity seemed to influence motor development in children with a hearing impairment and probably contributed to the relatively high-performance levels

of the participants in their study. In the TAPQOL questionnaire, there was no notable change in this domain post-intervention. However, in the TACQOL questionnaire, more parents/guardians stated that that their child *occasionally* experienced 'difficulty with doing things handily or quickly' post intervention. This is important, because this suggests that the intervention had a positive effect on fine motor ability, which is supported by the outcome of the motor ability testing for age band 2. Thus, attending schools providing early physical interventions and a structured physical education programme designed to meet the specific needs of children who are hard of hearing can contribute to a better acquisition of motor skills.

Autonomy Domain

A sense of autonomy and independency is often delayed or non-existent due to the language and communication delay (De Kegel et al., 2012). Meadow-Orlans, Mertens, & Sass-Lehrer (2003) found that hearing parents of children with HI struggle to establish effective communication within their families, and that one third of the parents they surveyed communicated through speech alone with their children. Ineffective parent-child communication could cause feelings of inadequacy, frustration and depression on the part of parents (Kushalnagar et al., 2007). This is important to note as this is the parent's perception of how well they feel their child is coping in terms of being independent and self-sufficient.

In the TAPQOL questionnaire, no notable change was noted post-intervention, however less parents/guardians stated that their child (7-9 years) never had 'difficulty going to the lavatory on his/her own' after the intervention, in the TACQOL questionnaire. In addition, more parents/guardians felt that their child (7-9years) never experienced 'difficulty with riding a

bicycle'. The results suggest that as a result of the exercise intervention, there has been an improvement in the children's self-esteem and confidence.

Cognitive Domain

It is also important to highlight that cognitive development tends to be delayed in children who are hearing impaired because language and cognition are co-dependent. There seems to be increasing evidence that motor function and scholastic achievement are related. Motor and cognitive skills have a similar developmental timetable with an accelerated development between the ages of 5 and 10 years (Anderson, Anderson, Northam, Jacobs, & Catroppa, 2001) and have several common underlying processes, such as sequencing, monitoring, and planning (Roebers & Kauer, 2009). A review by Haapala (2013) found that better motor skills are related to more efficient cognitive functions including inhibitory control and working memory.

More parents/guardians stated that their child (4-6 years) did not experience 'lying awake at night' after the intervention. Regular physical activity that's part of a consistent routine, can help boost sleep duration, in addition to sleep quality. It can also reduce stress and relieve anxiety. Stress and anxiety are common causes of sleep problems, including trouble falling asleep and sleeping restlessly during the night. In addition, more parents/guardians stated that their child (7-9 years) did not experience 'difficulty understanding what others said', 'difficulty with arithmetic', 'difficulty with reading' difficulty with writing', 'learning' and in 'saying what he/she meant' after the intervention.

An improvement in the Cognitive functioning of the children was seen throughout both age groups tested (i.e. in both the post-intervention results of the TAPQOL and the TACQOL).

This finding is supported by Xiong et al., (2018), who found that there was an improvement in overall executive functioning after children who were hearing impaired participated in an established exercise programme. Furthermore, Chen, Jiang, Ji, Tao, Zhu and Yan (2018) found positive effects on working memory and shifting of executive function in preadolescent children with a hearing impairment after an 8-week moderate skipping training programme, which supports the outcome and results of the current study due to the improved state of cognition after the exercise intervention.

Social Domain

The inability to use language efficiently is likely to have adverse effects on the child's personality development and self-image. "Language occupies a central role in social learning," and therefore impacts a child's ability to acquire the social skills needed to communicate successfully (Easterbrooks & Baker, 2002, p.38). A hearing impairment impacts language and communication development, which can "dramatically alter" the acquisition of social skills (Brackett, 1997).

Sport and social events like games and physical activities usually promote social interaction, however from the TAPQOL questionnaire, parents/guardians felt that there was no notable change from pre- to post-intervention in their children for this domain; in fact, there was very little (if any) change. This may be as a result of the programme being too short or that their children are quite comfortable in their social skills with each other and their families, as there was no decrease in their ability to understand or interpret language.

More parents/guardians noted that their child (7-9 years) was often 'able to play or talk happily with other children' post-intervention. Exercise and physical activity promote

sociability, confidence and social inclusion and skills amongst children. It is also important to highlight that there was also an increase in 'restlessness or impatience' and 'defiance' seen in the behaviour of the children towards their parents/guardians after the intervention. Over-stimulation can cause restlessness and poor behaviour. This can be exacerbated by the effect of activity on the body, triggering the need for sleep and rest.

Positive Emotions Domain

Contentedness and happiness are common 'symptoms' of activity. When you start exercising, your brain recognizes this as a moment of stress. As your heart rate increases, the brain thinks you are either fighting the enemy or fleeing from it. To protect yourself and your brain from stress, a protein called Brain-Derived Neurotrophic Factor (BDNF) is released as well as endorphins, also known as the 'feel good hormones'. This BDNF has a protective and reparative element to memory neurons and acts as a reset switch (Widrich, 2014) and endorphins tend to reduce the discomfort of exercise, block the feeling of possible pain and are even associated with a feeling of euphoria. That is why we often feel so at ease and things are clear after exercising and ultimately feel happy. More parents/guardians stated that their child (4-6 years) displayed a 'Content' (positive) emotion post-intervention and it is safe to assume that this is a direct result of the above-mentioned cause.

In addition, because movement is an important aspect in the development of a child's physical, cognitive and social characteristics (Cools et al., 2009), it is to be expected and well supported by the previously mentioned studies, to see an improvement in the cognitive response post exercise intervention as well as improved positive emotion and body development and awareness. In the TACQOL outcomes for this domain, more

parents/guardians noted that their child felt ‘contented’ post-intervention. Once more, this can be attributed by the endorphins released as a result of activity.

Negative Emotions Domain

Hearing parents often describe their children who are hearing impaired as “aggressive, disobedient and easily frustrated” (Spencer et al., 2000). Calderon and Greenberg (in Spencer *et al*., 2000: 134) state that over the past few years research has revealed that the cause of inappropriate behaviour is not the deafness *per se*, but rather the complexity of variables and interactions pertaining to the child as well as family and environment. Less parents/guardians felt that their child (4-6 years) experienced temper tantrums or problems post-intervention. Similarly, less parents/guardians felt that their child (7-9 years) was never ‘fussy’, ‘irritated’, “aggressive’, ‘jealous’ or ‘worried’. This falls in line with the fact that children were more relaxed and sociable. They were able to engage well whilst releasing built up energies which could previously have been causing these negative emotions. In contrast, more parents/guardians stated that they felt that their child (7-9 years) was often ‘short-tempered’ after the intervention, which could be as a result of frustration or irritability due to insufficient rest or sleep. This could be attributed to several factors, including social and emotional well-being at the time. In addition, due to physical activity also inducing sleepiness, irritability may also be a ‘side-effect’.

It can therefore be deduced, based on the positive outcomes of this study, that there were improvements made to both motor skill development and QoL when children with HI were given the opportunity to participate in physical activity. In stating this, perhaps it is important to note that there is a strong need earlier intervention to occur at schools and for activity programmes to be properly designed, especially for children with hearing impairment.

CONCLUSIONS

The findings of this study suggest that motor control programme including eye-hand co-ordination, visual-motor training, balance training and general co-ordination exercises can be useful to improve gross motor skills and postural control in children with sensorineural hearing loss. In addition, the results of this study revealed that an exercise programme can positively impact several components that satisfy 'optimum' quality of life experiences Therefore, specific programmes designed to improve motor skills for children with HI may have the long-term effect of decreasing HI-induced motor delays and deficits and improving the quality of life for these children. Further research is crucial because if more evidence that these interventions can improve the motor skill deficits and enhance QoL in hearing impaired children exist, the findings can be generalised

RECOMMENDATIONS

Based on the findings of the study, the following recommendations are offered:

- Include a control group. A control group is an essential part of an experiment because it allows you to eliminate and isolate the variables measured in the study and any changes in variables can then be attributed to the intervention.
- The use of a larger sample size. This will allow for better population representation as well as a narrower margin of error. This would also allow for generalising the findings to a larger population of hearing-impaired children, which would facilitate the appropriate treatment to minimize the negative impacts of their impairment.
- An intervention programme that continued for longer period would allow more time for adaptations to take place and perhaps elicit more significant results. Motor skill

development requires time and continuity to see more promising and positive outcomes.

- Recruiting samples from private schools. It would have been beneficial to compare differences in pre- and post-intervention statistics with previously disadvantaged schools and to determine whether the intervention programme of this study would have a similar effect in a private school setting.
- This motor skills/physical activity intervention programme proved to be beneficial in the improvement of some motor skill ability and some aspects of quality of life. Therefore, it may be beneficial for all centres, pre- and primary schools for the hearing impaired to implement and utilise such programmes during their Physical Education (PE) lessons.
- Early intervention programmes should be used and implemented in pre-and primary schools to remediate the observed low levels of motor proficiency and prevent further motor skill delays and deficits.
- Training the relevant physical education teachers to facilitate this intervention programme during future physical education lessons would expand the opportunity for more children to participate in and benefit from this programme.
- All physical education teachers, should attain some background information on and experience in facilitating motor skills intervention programmes in order to ensure competence in their facilitation and skill teaching, thus, ensuring an opportunity for every child to participate and benefit from a motor skills intervention programme.

STUDY LIMITATIONS

Further to the on the recommendations above, the researcher has been careful not to attribute the significant outcomes solely to the intervention due to there being no control group in this study. There was no control group because there were not enough learners available to have sufficient children for two groups, and a control group would have been 'tainted' by the intervention group as they are in the same classes. In addition, this approach does not raise any particular ethical issues of social exclusion or discrimination. The researcher felt that this design was best for the morale and discipline of the children's needs at the time. This was to ensure fair treatment and an overall happy experience as this (fun games/activities hosted by a team of eternal volunteers) was an 'out of the ordinary' practice at the school. Maturation over the 12-week intervention period could have contributed to the findings and the changes noted could be attributable to child development rather than the actual intervention in itself. Without a control group, this is difficult to exclude.

This study was limited to investigating the effect of a motor skills exercise programme on quality of life and motor skills development in hard of hearing children, therefore the results cannot be generalised to children with other classified special needs or disabilities.

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Print

TAPQOL

Questionnaire

for parents of children aged 1 to 5

Please answer the following questions first.

Is the child for whom you are completing this questionnaire a boy or a girl? ❑ boy ❑ girl

What is the child's date of birth? ..... (day) ..... (month) ..... (year)

On what date are you completing this questionnaire? ..... (day) ..... (month) ..... (year)

LUMC

TNO

UK/English FINAL version of 03-Feb-2012 - TransPerfect

INSTRUCTIONS

Dear Sir / Madam,

The questions in this survey pertain to different aspects of your child's health. Please answer the questions by placing an X in the box next to the response that best describes your child.

For example:

Has your child had an earache in the last 3 months?

Earache ☒ never ❑ occasionally ❑ often

1 **At those times, my child felt:**

If your child never had an earache, as in the above example, please go to the next question.

If your child had an earache 'occasionally' or 'often', please place an X by one of those answers. Just below these two answers you will find the statement beginning with "At those times, my child felt". Indicate there how your child felt. For example:

Has your child had an earache in the last 3 months?

Earache ❑ never ☒ occasionally ❑ often

1 **At those times, my child felt:**

❑ well ❑ not very well ☒ unwell ❑ very unwell

Then go to the next question.

This was an example.
The questionnaire starts on the next page.

In the last 3 months has your child had:

Stomach ache or abdominal pain ❑ never ❑ occasionally ❑ often

1

At those times, my child felt:

❑ well ❑ not very well ❑ unwell ❑ very unwell

Colic (abdominal cramps) ❑ never ❑ occasionally ❑ often

2

At those times, my child felt:

❑ well ❑ not very well ❑ unwell ❑ very unwell

Eczema ❑ never ❑ occasionally ❑ often

3

At those times, my child felt:

❑ well ❑ not very well ❑ unwell ❑ very unwell

Itching ❑ never ❑ occasionally ❑ often

4

At those times, my child felt:

❑ well ❑ not very well ❑ unwell ❑ very unwell

Dry skin ❑ never ❑ occasionally ❑ often

5

At those times, my child felt:

❑ well ❑ not very well ❑ unwell ❑ very unwell

Bronchitis ❑ never ❑ occasionally ❑ often

6

At those times, my child felt:

❑ well ❑ not very well ❑ unwell ❑ very unwell

Difficulty breathing or lung problems ❑ never ❑ occasionally ❑ often

7

At those times, my child felt:

❑ well ❑ not very well ❑ unwell ❑ very unwell

In the last 3 months has your child had:

Shortness of breath ❑ never ❑ occasionally ❑ often

8

At those times, my child felt:

❑ well ❑ not very well ❑ unwell ❑ very unwell

Nausea ❑ never ❑ occasionally ❑ often

9

At those times, my child felt:

❑ well ❑ not very well ❑ unwell ❑ very unwell

How did your child sleep over the last 3 months?

Did your child sleep restlessly? ❑ never ❑ occasionally ❑ often

10

At those times, my child felt:

❑ well ❑ not very well ❑ unwell ❑ very unwell

Did your child lie awake at night? ❑ never ❑ occasionally ❑ often

11

At those times, my child felt:

❑ well ❑ not very well ❑ unwell ❑ very unwell

Did your child cry during the night? ❑ never ❑ occasionally ❑ often

12

At those times, my child felt:

❑ well ❑ not very well ❑ unwell ❑ very unwell

Did your child have trouble sleeping through the night? ❑ never ❑ occasionally ❑ often

13

At those times, my child felt:

❑ well ❑ not very well ❑ unwell ❑ very unwell

How did your child eat and drink over the last 3 months?

Did your child have a poor appetite? ❑ never ❑ occasionally ❑ often

14

At those times, my child felt:

❑ well ❑ not very well ❑ unwell ❑ very unwell

Did your child have difficulty eating enough? ❑ never ❑ occasionally ❑ often

15

At those times, my child felt:

❑ well ❑ not very well ❑ unwell ❑ very unwell

Did your child refuse to eat? ❑ never ❑ occasionally ❑ often

16

At those times, my child felt:

❑ well ❑ not very well ❑ unwell ❑ very unwell

How was your child's behaviour over the last 3 months?

My child was short-tempered 17	❑ never	❑ occasionally	❑ often
My child was aggressive 18	❑ never	❑ occasionally	❑ often
My child was fussy, irritated 19	❑ never	❑ occasionally	❑ often
My child was angry 20	❑ never	❑ occasionally	❑ often
My child was restless or impatient with me 21	❑ never	❑ occasionally	❑ often
My child was rebellious/defiant with me 22	❑ never	❑ occasionally	❑ often
I could not manage my child 23	❑ never	❑ occasionally	❑ often

How was your child's mood in the last 3 months?

Cheerful ❑ never ❑ occasionally ❑ often
24

Content ❑ never ❑ occasionally ❑ often
25

Happy ❑ never ❑ occasionally ❑ often
26

Fearful ❑ never ❑ occasionally ❑ often
27

Tense ❑ never ❑ occasionally ❑ often
28

Worried ❑ never ❑ occasionally ❑ often
29

Energetic ❑ never ❑ occasionally ❑ often
30

Active ❑ never ❑ occasionally ❑ often
31

Lively ❑ never ❑ occasionally ❑ often
32

If your child is *under* the age of 18 months, you do **not** have to complete the rest of this questionnaire.
Thank you very much for your co-operation!

If your child is 18 months of age or *older*, please continue completing the questions on the following pages.

How was your child's behaviour with other children over the last 3 months?

My child was able to play nicely with other children ❑ never ❑ occasionally ❑ often

33

My child was at ease with other children ❑ never ❑ occasionally ❑ often

34

My child was self-assured with other children ❑ never ❑ occasionally ❑ often

35

Over the last 3 months, compared with other children of the same age, did your child have:

Difficulty walking? ❑ no ❑ yes, a little ❑ yes, a lot ❑ is not walking (yet)

36

At those times, my child felt:

❑ well ❑ not very well ❑ unwell ❑ very unwell

Difficulty running? ❑ no ❑ yes, a little ❑ yes, a lot ❑ is not walking (yet)

37

At those times, my child felt:

❑ well ❑ not very well ❑ unwell ❑ very unwell

125

Difficulty climbing stairs without help? ❑ no ❑ yes, a little ❑ yes, a lot ❑ is not walking (yet)

38

At those times, my child felt:

❑ well ❑ not very well ❑ unwell ❑ very unwell

Difficulty keeping balance? ❑ no ❑ yes, a little ❑ yes, a lot

39

At those times, my child felt:

❑ well ❑ not very well ❑ unwell ❑ very unwell

Over the last 3 months, compared with other children of the same age, did your child have:

Difficulty understanding what others were saying?

40

❑ never ❑ occasionally ❑ often

At those times, my child felt:

❑ well ❑ not very well ❑ unwell ❑ very unwell

Difficulty talking clearly?

41

❑ never ❑ occasionally ❑ often

At those times, my child felt:

❑ well ❑ not very well ❑ unwell ❑ very unwell

Difficulty expressing himself/herself?

42

❑ never ❑ occasionally ❑ often

At those times, my child felt:

❑ well ❑ not very well ❑ unwell ❑ very unwell

Difficulty explaining what he/she wants?

43

❑ never ❑ occasionally ❑ often

At those times, my child felt:

❑ well ❑ not very well ❑ unwell ❑ very unwell

This is the end of the questionnaire.
Thank you for completing it!

Print

Number: [_ _ _ _ _ _ _ _]

TACQOL

Questionnaire

for parents / carers of children aged 6 to 15

Would you please answer the following questions first?

Is the child in question a boy or a girl? ❑ boy ❑ girl

What is the child's date of birth? ....
(month) (day) (year)

On what date was this questionnaire completed? ....
(month) (day) (year)

INSTRUCTIONS

Dear parents,

We wish to know how your child has been in recent weeks.

On the pages which follow, you will find a number of questions.
There are a number of answers for each question.
Choose the answer which is the most appropriate for your child and place a cross in the box alongside that answer.

For example (you do not need to answer this question):

Has your child had headaches?

☒ never ❑ occasionally ❑ often

1

At that time, my child felt:

❑ fine ❑ not so good ❑ quite bad ❑ bad

Has your child had earaches or sore throats?

❑ never ☒ occasionally ❑ often

2

At that time, my child felt:

❑ fine ❑ not so good ☒ quite bad ❑ bad

If your child has **not** suffered from headaches **at all** in recent weeks, place a cross in the box next to 'never'. You can then go on to the next question about sore throats as in the example above.

If your child had a headache "occasionally" or "often", place a cross in the appropriate box. Below these boxes, you find the words: '**At that time, my child felt:**'. You then cross the box stating how your child felt when he or she had a headache.

For example:

Has your child had headaches?

❑ never ☒ occasionally ❑ often

1

At that time, my child felt:

❑ fine ❑ not so good ❑ quite bad ☒ bad

You then proceed to the next question.

Pain and symptoms in recent weeks.

Try to remember how your child was in recent weeks.

Has your child had earaches or sore throats? ❑ never ❑ occasionally ❑ often

1

At that time, my child felt:

❑ fine ❑ not so good ❑ quite bad ❑ bad

Has your child had stomach-aches or abdominal pain? ❑ never ❑ occasionally ❑ often

2

At that time, my child felt:

❑ fine ❑ not so good ❑ quite bad ❑ bad

Has your child had headaches? ❑ never ❑ occasionally ❑ often

3

At that time, my child felt:

❑ fine ❑ not so good ❑ quite bad ❑ bad

Has your child been dizzy? ❑ never ❑ occasionally ❑ often

4

At that time, my child felt:

❑ fine ❑ not so good ❑ quite bad ❑ bad

Has your child felt sick/nauseous? ❑ never ❑ occasionally ❑ often

5

At that time, my child felt:

❑ fine ❑ not so good ❑ quite bad ❑ bad

Was your child tired? ❑ never ❑ occasionally ❑ often

6

At that time, my child felt:

❑ fine ❑ not so good ❑ quite bad ❑ bad

Was your child sleepy? ❑ never ❑ occasionally ❑ often

7

At that time, my child felt:

❑ fine ❑ not so good ❑ quite bad ❑ bad

Was your child dozy/lethargic? ❑ never ❑ occasionally ❑ often

8

At that time, my child felt:

❑ fine ❑ not so good ❑ quite bad ❑ bad

Did your child suffer from pain or other symptoms? ❑ never ❑ occasionally ❑ often

9

At that time, my child felt:

❑ fine ❑ not so good ❑ quite bad ❑ bad

What sort of pains or symptoms?

Only if your child suffered from pains or other symptoms in recent weeks:
What do you think caused those pains or those symptoms?

10

Things which your child had difficulty with in recent weeks.

Try to remember how your child was in recent weeks. Did he or she have...

Difficulty with running? ❑ never ❑ occasionally ❑ often

11

At that time, my child felt:

❑ fine ❑ not so good ❑ quite bad ❑ bad

Difficulty with walking? ❑ never ❑ occasionally ❑ often

12

At that time, my child felt:

❑ fine ❑ not so good ❑ quite bad ❑ bad

Difficulty with standing? ❑ never ❑ occasionally ❑ often

13

At that time, my child felt:

❑ fine ❑ not so good ❑ quite bad ❑ bad

Difficulty walking downstairs? ❑ never ❑ occasionally ❑ often

14

At that time, my child felt:

❑ fine ❑ not so good ❑ quite bad ❑ bad

Difficulty with playing? ❑ never ❑ occasionally ❑ often

15

At that time, my child felt:

❑ fine ❑ not so good ❑ quite bad ❑ bad

Difficulty with running or walking for long periods, with stamina? ❑ never ❑ occasionally ❑ often

16

At that time, my child felt:

❑ fine ❑ not so good ❑ quite bad ❑ bad

Difficulty with balance? ❑ never ❑ occasionally ❑ often

17

At that time, my child felt:

❑ fine ❑ not so good ❑ quite bad ❑ bad

Difficulty with doing things handily or quickly? ❑ never ❑ occasionally ❑ often

18

At that time, my child felt:

❑ fine ❑ not so good ❑ quite bad ❑ bad

Only if your child had problems of this kind in recent weeks:
What do you think caused these problems?

19

Things which your child had difficulty with in recent weeks.

Try to remember how your child was in recent weeks. Did he or she have...

Difficulty with going to school on his/her own? ❑ never ❑ occasionally ❑ often

20

At that time, my child felt:

❑ fine ❑ not so good ❑ quite bad ❑ bad

Difficulty washing himself/herself? ❑ never ❑ occasionally ❑ often

21

At that time, my child felt:

❑ fine ❑ not so good ❑ quite bad ❑ bad

Difficulty getting dressed on his/her own? ❑ never ❑ occasionally ❑ often

22

At that time, my child felt:

❑ fine ❑ not so good ❑ quite bad ❑ bad

Difficulty going to the lavatory on his/her own? ❑ never ❑ occasionally ❑ often

23

At that time, my child felt:

❑ fine ❑ not so good ❑ quite bad ❑ bad

Difficulty with eating or drinking on his/her own? ❑ never ❑ occasionally ❑ often

24

At that time, my child felt:

❑ fine ❑ not so good ❑ quite bad ❑ bad

Difficulty with sports or going out to play on his/her own? ❑ never ❑ occasionally ❑ often

25

At that time, my child felt:

❑ fine ❑ not so good ❑ quite bad ❑ bad

Difficulty with doing hobbies on his/her own? ❑ never ❑ occasionally ❑ often

26

At that time, my child felt:

❑ fine ❑ not so good ❑ quite bad ❑ bad

Difficulty with riding a bicycle? ❑ never ❑ occasionally ❑ often

27

At that time, my child felt:

❑ fine ❑ not so good ❑ quite bad ❑ bad

Only if your child had problems of this kind in recent weeks:
What do you think caused these problems?

28

Things which your child had difficulty with in recent weeks.

Try to remember how your child was in recent weeks. Did he or she have...

Difficulty with paying attention, concentrating? ❑ never ❑ occasionally ❑ often

29

At that time, my child felt:

❑ fine ❑ not so good ❑ quite bad ❑ bad

Difficulty understanding schoolwork? ❑ never ❑ occasionally ❑ often

30

At that time, my child felt:

❑ fine ❑ not so good ❑ quite bad ❑ bad

Difficulty understanding what others said? ❑ never ❑ occasionally ❑ often

31

At that time, my child felt:

❑ fine ❑ not so good ❑ quite bad ❑ bad

Difficulty with arithmetic? ❑ never ❑ occasionally ❑ often

32

At that time, my child felt:

❑ fine ❑ not so good ❑ quite bad ❑ bad

Difficulty with reading? ❑ never ❑ occasionally ❑ often

33

At that time, my child felt:

❑ fine ❑ not so good ❑ quite bad ❑ bad

Difficulty with writing? ❑ never ❑ occasionally ❑ often

34

At that time, my child felt:

❑ fine ❑ not so good ❑ quite bad ❑ bad

Difficulty with learning? ❑ never ❑ occasionally ❑ often

35

At that time, my child felt:

❑ fine ❑ not so good ❑ quite bad ❑ bad

Difficulty in saying what he/she meant? ❑ never ❑ occasionally ❑ often

36

At that time, my child felt:

❑ fine ❑ not so good ❑ quite bad ❑ bad

Only if your child had problems of this kind in recent weeks:
What do you think caused these problems?

37

Dealings with other children and with you in recent weeks.

Try to remember how your child was in recent weeks

My child was able to play or talk happily with other children. ❑ yes ❑ too little ❑ never

38

At that time, my child felt:

❑ fine ❑ not so good ❑ quite bad ❑ bad

My child was able to stand up for himself/herself with other children. ❑ yes ❑ too little ❑ never

39

At that time, my child felt:

❑ fine ❑ not so good ❑ quite bad ❑ bad

Other children asked my child to play with them. ❑ yes ❑ too little ❑ never

40

At that time, my child felt:

❑ fine ❑ not so good ❑ quite bad ❑ bad

My child was at ease with other children. ❑ yes ❑ too little ❑ never

41

At that time, my child felt:

❑ fine ❑ not so good ❑ quite bad ❑ bad

My child was able to play or talk happily with us - the parent(s). ❑ yes ❑ too little ❑ never

42

At that time, my child felt:

❑ fine ❑ not so good ❑ quite bad ❑ bad

My child was incommunicative or quiet with us - the parent(s) ❑ never ❑ occasionally ❑ often

43

At that time, my child felt:

❑ fine ❑ not so good ❑ quite bad ❑ bad

My child was restless or impatient with us - the parent(s) ❑ never ❑ occasionally ❑ often

44

At that time, my child felt:

❑ fine ❑ not so good ❑ quite bad ❑ bad

My child was defiant with us - the parent(s) ❑ never ❑ occasionally ❑ often

45

At that time, my child felt:

❑ fine ❑ not so good ❑ quite bad ❑ bad

If things were not always satisfactory in dealings with other children or with you:
What do you think was the reason?

46

In recent weeks, my child felt...

Joyful 47	❑ never	❑ occasionally	❑ often	**Relaxed** 55	❑ never	❑ occasionally	❑ often
Sad 48	❑ never	❑ occasionally	❑ often	**Aggressive** 56	❑ never	❑ occasionally	❑ often
In good spirits 49	❑ never	❑ occasionally	❑ often	**Happy** 57	❑ never	❑ occasionally	❑ often
Angry 50	❑ never	❑ occasionally	❑ often	**Short-tempered** 58	❑ never	❑ occasionally	❑ often
Contented 51	❑ never	❑ occasionally	❑ often	**Confident** 59	❑ never	❑ occasionally	❑ often
Worried 52	❑ never	❑ occasionally	❑ often	**Jealous** 60	❑ never	❑ occasionally	❑ often
Enthusiastic 53	❑ never	❑ occasionally	❑ often	**Cheerful** 61	❑ never	❑ occasionally	❑ often
Gloomy 54	❑ never	❑ occasionally	❑ often	**Anxious** 62	❑ never	❑ occasionally	❑ often

If your child did not always feel fine in recent weeks:
What was the reason?
63

This is the end of the questionnaire
Thank you for completing it !

TAPQOL Vraelys

Vir ouers met kinders tussen die ouderdomme 1-5 jaar.

Antwoord asseblief die volgende vrae eerste:

1. Is die kind vir wie die vraelys ingevul word ‘n seuntjie of ‘n dogtertjie?
2. Wat is die kind se geboorte datum?
3. Wat is vandag se datum?

Instruksies

Geagte Mr./Mev.

Die vrae in hierdie opname verlang na verskillende aspekte van u kind se gesondheid. Antwoord asseblief die vrae deur ‘n in die blok langs die antwoord wat u kind die beste beskryf.

Byvoorbeeld:

Het u kind oorpyn in die laaste 3 maande gehad?

Oorpyn

- ☒ Nooit
- ☐ Soms
- ☐ Gereeld

Gedurende die tyd voel my kind:

- ☐ Goed
- ☐ Nie baie goed nie
- ☒ Sleg

Dan begin u met die volgende vraag.

Hierdie was slegs voorbeeld.

Die vraelys begin op die volgende bladsy.

1. Maag pyn gehad
   - ☐ Nooit
   - ☐ Soms
   - ☐ Gereeld

   Gedurende die tyd voel my kind:
   - ☐ Goed
   - ☐ Nie baie goed nie
   - ☐ Sleg
   - ☐ Baie sleg

2. Koliek (maag krampe)
   - ☐ Nooit
   - ☐ Soms
   - ☐ Gereeld

   Gedurende die tyd voel my kind:
   - ☐ Goed
   - ☐ Nie baie goed nie
   - ☐ Sleg
   - ☐ Baie sleg

3. Ekseem
   - ☐ Nooit
   - ☐ Soms
   - ☐ Gereeld

   Gedurende die tyd voel my kind:
   - ☐ Goed
   - ☐ Nie baie goed nie
   - ☐ Sleg
   - ☐ Baie sleg

4. Jukkerig
   - ☐ Nooit
   - ☐ Soms
   - ☐ Gereeld

   Gedurende die tyd voel my kind:
   - ☐ Goed
   - ☐ Nie baie goed nie
   - ☐ Sleg
   - ☐ Baie sleg

5. Droë vel
   - ☐ Nooit
   - ☐ Soms
   - ☐ Gereeld

   Gedurende die tyd voel my kind:
   - ☐ Goed
   - ☐ Nie baie goed nie
   - ☐ Sleg
   - ☐ Baie sleg

6. Brongitis
   - ☐ Nooit
   - ☐ Soms
   - ☐ Gereeld

   Gedurende die tyd voel my kind:
   - ☐ Goed
   - ☐ Nie baie goed nie
   - ☐ Sleg
   - ☐ Baie sleg

7. Sukkel om asem te haal of long probleme
   - ☐ Nooit
   - ☐ Soms
   - ☐ Gereeld

   Gedurende die tyd voel my kind:
   - ☐ Goed
   - ☐ Nie baie goed nie
   - ☐ Sleg
   - ☐ Baie sleg

8. Kort van asem
   - ☐ Nooit
   - ☐ Soms
   - ☐ Gereeld

   Gedurende die tyd voel my kind:
   - ☐ Goed
   - ☐ Nie baie goed nie
   - ☐ Sleg
   - ☐ Baie sleg

9. Naarheid
   - ☐ Nooit
   - ☐ Soms

Gedurende die tyd voel my kind:

- ☐ Goed
- ☐ Nie baie goed nie
- ☐ Sleg
- ☐ Baie sleg

Hoe het u kind gedurende die laaste paar maande geslaap?

10. Was u kind rusteloos?
    - ☐ Nooit
    - ☐ Soms
    - ☐ Gereeld

    Gedurende die tyd voel my kind:
    - ☐ Goed
    - ☐ Nie baie goed nie
    - ☐ Sleg
    - ☐ Baie sleg

11. Het u kind wakker gelê gedurende die nag?
    - ☐ Nooit
    - ☐ Soms
    - ☐ Gereeld

    Gedurende die tyd voel my kind:
    - ☐ Goed
    - ☐ Nie baie goed nie
    - ☐ Sleg
    - ☐ Baie sleg

12. Het u kind gedurende die nag gehuil?
    - ☐ Nooit
    - ☐ Soms
    - ☐ Gereeld

    Gedurende die tyd voel my kind:
    - ☐ Goed
    - ☐ Nie baie goed nie
    - ☐ Sleg
    - ☐ Baie sleg

13. Het u kind gesukkel om deur die nag te slaap?
    - ☐ Nooit
    - ☐ Soms
    - ☐ Gereeld

Gedurende die tyd voel my kind:

- ☐ Goed
- ☐ Nie baie goed nie
- ☐ Sleg
- ☐ Baie sleg

Hoe het u kind die afgelope 3 maande geëet en gedrink?

14. Het u kind 'n slegte aptyt gehad?
    - ☐ Nooit
    - ☐ Soms
    - ☐ Gereeld

    Gedurende die tyd voel my kind:
    - ☐ Goed
    - ☐ Nie baie goed nie
    - ☐ Sleg
    - ☐ Baie sleg

15. Sukkel u kind om genoeg te eet?
    - ☐ Nooit
    - ☐ Soms
    - ☐ Gereeld

    Gedurende die tyd voel my kind:
    - ☐ Goed
    - ☐ Nie baie goed nie
    - ☐ Sleg
    - ☐ Baie sleg

16. Het u kind geweier om te eet?
    - ☐ Nooit
    - ☐ Soms
    - ☐ Gereeld

    Gedurende die tyd voel my kind:
    - ☐ Goed
    - ☐ Nie baie goed nie
    - ☐ Sleg
    - ☐ Baie sleg

Hoe was u kind se gedrag die afgelope 3 maande?

17. My kind was humeurig
    - ☐ Gereeld
    - ☐ Nooit
    - ☐ Soms
    - ☐ Gereeld

18. My kind was aggressief
    - ☐ Nooit
    - ☐ Soms
    - ☐ Gereeld

19. My kind was geïrriteerd
    - ☐ Nooit
    - ☐ Soms
    - ☐ Gereeld

20. My kind was kwaad
    - ☐ Nooit
    - ☐ Soms
    - ☐ Gereeld

21. My kind was rusteloos en ongeduldig met my
    - ☐ Nooit
    - ☐ Soms
    - ☐ Gereeld

22. My kind was rebels en ongeskik met my
    - ☐ Nooit
    - ☐ Soms
    - ☐ Gereeld

23. Ek kon nie my kind hanteer nie
    - ☐ Nooit
    - ☐ Soms
    - ☐ Gereeld

Hoe was u kind se bui (humeur) die afgelope 3 maande?

24. Vrolik:

- ☐ Nooit
- ☐ Soms
- ☐ Gereeld

25. Tevrede:
    - ☐ Nooit
    - ☐ Soms
    - ☐ Gereeld
26. Gelukkig:
    - ☐ Nooit
    - ☐ Soms
    - ☐ Gereeld
27. Bang:
    - ☐ Nooit
    - ☐ Soms
    - ☐ Gereeld
28. Gespanne:
    - ☐ Nooit
    - ☐ Soms
    - ☐ Gereeld
29. Bekommerd:
    - ☐ Nooit
    - ☐ Soms
    - ☐ Gereeld
30. Energiek:
    - ☐ Nooit
    - ☐ Soms
    - ☐ Gereeld
31. Aktief:
    - ☐ Nooit
    - ☐ Soms
    - ☐ Gereeld
32. Lewendig:
    - ☐ Nooit
    - ☐ Soms
    - ☐ Gereeld

Indien u kind <u>onder die ouderdom van 18 maande is,</u> hoef u <u>nie</u> die res van die vraelys te voltooi nie.

Dankie vir u hulp!
Indien u kind <u>18 maande of ouer is,</u> voltooi asseblief die res van die vraelys!

Hoe was u kind se gedrag gedurende die laste 3 maande?

33. My kind kon goed saam met ander kinders speel

- ☐ Nooit
- ☐ Soms
- ☐ Gereeld

34. My kind was op sy gemak saam met ander kinders

- ☐ Nooit
- ☐ Soms
- ☐ Gereeld

35. My kind was self versekerd saam met ander kinders

- ☐ Nooit
- ☐ Soms
- ☐ Gereeld

Gedurende die vorige 3 maand, was dit vir u kind, in vergelyking met ander kinders van dieselfde ouderdom:

36. Moeilik om te loop?

- ☐ Nee
- ☐ Ja , 'n bietjie
- ☐ Ja, baie
- ☐ Loop nog nie

My kind voel gedurende sulke tye:

- ☐ Goed
- ☐ Nie so goed nie
- ☐ Sleg
- ☐ Baie sleg

37. Moeilik om te hardloop?

- ☐ Nee
- ☐ Ja , 'n bietjie
- ☐ Ja, baie
- ☐ Loop nog nie

My kind voel gedurende sulke tye:

- ☐ Goed
- ☐ Nie so goed nie
- ☐ Sleg
- ☐ Baie sleg

38. Moeilik om trappe te klim sonder hulp?

- ☐ Nee
- ☐ Ja , 'n bietjie
- ☐ Ja, baie
- ☐ Loop nog nie

My kind voel gedurende sulke tye:

- ☐ Goed
- ☐ Nie so goed nie
- ☐ Sleg
- ☐ Baie sleg

39. Moeilik om sy balans te behou?

- ☐ Nee
- ☐ Ja , ‘n bietjie
- ☐ Ja, baie
- ☐ Loop nog nie

My kind voel gedurende sulke tye:

- ☐ Goed
- ☐ Nie so goed nie
- ☐ Sleg
- ☐ Baie sleg

Gedurende die vorige 3 maand, was dit vir u kind, in vergelyking met ander kinders van dieselfde ouderdom:

40. Moeilik om te verstaan wat ander sê?

- ☐ Nooit
- ☐ Soms
- ☐ Gereeld

Gedurende die tyd voel my kind:

- ☐ Goed
- ☐ Nie baie goed nie
- ☐ Sleg
- ☐ Baie sleg

41. Moeilik om duidelik te praat?

- ☐ Nooit
- ☐ Soms
- ☐ Gereeld

Gedurende die tyd voel my kind:

- ☐ Goed
- ☐ Nie baie goed nie
- ☐ Sleg
- ☐ Baie sleg

42. Moeilik om hom- of haarself uit te druk (hul self te verduidelik)
    - ☐ Nooit
    - ☐ Soms
    - ☐ Gereeld

    Gedurende die tyd voel my kind:
    - ☐ Goed
    - ☐ Nie baie goed nie
    - ☐ Sleg
    - ☐ Baie sleg
43. Moeilik om te verduidelik wat hy/sy wil hê?
    - ☐ Nooit
    - ☐ Soms
    - ☐ Gereeld

    Gedurende die tyd voel my kind:
    - ☐ Goed
    - ☐ Nie baie goed nie
    - ☐ Sleg
    - ☐ Baie sleg

Dit is die einde van die vraelys.
Dankie dat u dit voltooi het!

TAPCQOL Vraelys

Vir ouers met kinders tussen die ouderdomme 6 tot 15 jaar.

Antwoord asseblief die volgende vrae eerste.

1. Is die kind vir wie die vraelys ingevul word 'n seun of 'n dogter?
2. Wat is die kind se geboorte datum?
3. Wat is vandag se datum?

Instruksies

Geagte Mr./Mev.

Ons wil graag weet hoe dit met u kind gegaan het in die vorige paar weke.

Op die volgende bladsye is 'n aantal vrae.

Daar is 'n aantal antwoorde op elke vraag.

Kies die antwoord wat die meeste op u kind van toepassing is en maak 'n kruisie in die blokkie langs die antwoord.

As voorbeeld: (Jy hoef nie die vrae te beantwooord nie)

1. Het jou kind kopseer?
   - ☐ Nooit
   - ☒ Soms
   - ☐ Gereeld

   Gedurende die tyd voel my kind:
   - ☐ Goed
   - ☒ Nie baie goed nie
   - ☐ Sleg
   - ☐ Baie sleg

2. Het u kind oorpyn of seer keel?
   - ☒ Nooit
   - ☐ Soms
   - ☐ Gereeld

   Gedurende die tyd voel my kind:
   - ☐ Goed
   - ☐ Nie baie goed nie
   - ☐ Sleg
   - ☐ Baie sleg
   - ☐ Baie sleg

As u kind nie kopseer in die afgelope tyd gehad het nie, maak ‘n kruis in die blokkie langs ‘nooit’. Dan kan u na die volgende vraag toe gaan oor die seer keel soos in die voorbeeld hier bo.

Indien u kind kopseer ‘soms’ of ‘gereeld’ gehad het, maak ‘n kruisie in die toepaslike blokkie. Onder die deel vind u die woorde: ‘Gedurende die tyd voel my kind’: Nou kan u ‘n kruisie maak in die blokkie oor hoe jou kind gevoel het toe hy/sy ‘n kopseer gehad het.

As voorbeeld:

1. Het jou kind kopseer gehad?
   - ☒ Nooit
   - ☐ Soms
   - ☐ Gereeld

   Gedurende die tyd voel my kind:
   - ☐ Goed
   - ☐ Nie baie goed nie
   - ☐ Sleg
   - ☐ Baie sleg

Nou kan u voort gaan na die volgende vrae.

Pyn en simptome in die vorige weke.

Probeer onthou hoe jou kind in die vorige weke gevoel het.

1. Het u kind oorpyn of seerkeel gehad?
   - ☐ Nooit
   - ☐ Soms
   - ☐ Gereeld

   Gedurende die tyd voel my kind:
   - ☐ Goed
   - ☐ Nie baie goed nie
   - ☐ Sleg
   - ☐ Baie sleg

2. Het u kind maag- of abdominale pyn?
   - ☐ Nooit
   - ☐ Soms
   - ☐ Gereeld

Gedurende die tyd voel my kind:

- ☐ Goed
- ☐ Nie baie goed nie
- ☐ Sleg
- ☐ Baie sleg

3. Het u kind kopseer gehad?
   - ☐ Nooit
   - ☐ Soms
   - ☐ Gereeld

   Gedurende die tyd voel my kind:
   - ☐ Goed
   - ☐ Nie baie goed nie
   - ☐ Sleg
   - ☐ Baie sleg

4. Was u kind duiselig?
   - ☐ Nooit
   - ☐ Soms
   - ☐ Gereeld

   Gedurende die tyd voel my kind:
   - ☐ Goed
   - ☐ Nie baie goed nie
   - ☐ Sleg
   - ☐ Baie sleg

5. Was u kind naar?
   - ☐ Nooit
   - ☐ Soms
   - ☐ Gereeld

   Gedurende die tyd voel my kind:
   - ☐ Goed
   - ☐ Nie baie goed nie
   - ☐ Sleg
   - ☐ Baie sleg

6. Was u kind moeg?
   - ☐ Nooit
   - ☐ Soms
   - ☐ Gereeld

Gedurende die tyd voel my kind:

- ☐ Goed
- ☐ Nie baie goed nie
- ☐ Sleg
- ☐ Baie sleg

7. Was u kind slaperig?
   - ☐ Nooit
   - ☐ Soms
   - ☐ Gereeld

   Gedurende die tyd voel my kind:
   - ☐ Goed
   - ☐ Nie baie goed nie
   - ☐ Sleg
   - ☐ Baie sleg

8. Was u kind slaperig?
   - ☐ Nooit
   - ☐ Soms
   - ☐ Gereeld

   Gedurende die tyd voel my kind:
   - ☐ Goed
   - ☐ Nie baie goed nie
   - ☐ Sleg
   - ☐ Baie sleg

9. Het u kind pyn of ander simptome gehad?
   - ☐ Nooit
   - ☐ Soms
   - ☐ Gereeld

   Gedurende die tyd voel my kind:
   - ☐ Goed
   - ☐ Nie baie goed nie
   - ☐ Sleg
   - ☐ Baie sleg

Watter soort pyne of simptome

Slegs as u kind van pyn en ander simptome in die vorige weke gehad het:

10. Wat dink u was die oorsaak van die pyn en die simptome?

_____

Dinge waarmee u kind probleme gehad het in die vorige weke.

Probeer onthou hoe u kind in die vorige weke was. Het hy of sy probleme gehad .....

11. Om te hardloop?
    - ☐ Nooit
    - ☐ Soms
    - ☐ Gereeld

    Gedurende die tyd voel my kind:
    - ☐ Goed
    - ☐ Nie baie goed nie
    - ☐ Sleg
    - ☐ Baie sleg

12. Om te loop?
    - ☐ Nooit
    - ☐ Soms
    - ☐ Gereeld

    Gedurende die tyd voel my kind:
    - ☐ Goed
    - ☐ Nie baie goed nie
    - ☐ Sleg
    - ☐ Baie sleg

13. Om te staan?
    - ☐ Nooit
    - ☐ Soms
    - ☐ Gereeld

    Gedurende die tyd voel my kind:
    - ☐ Goed
    - ☐ Nie baie goed nie
    - ☐ Sleg
    - ☐ Baie sleg

14. Om by die trappe af te loop?

- ☐ Nooit
- ☐ Soms
- ☐ Gereeld

Gedurende die tyd voel my kind:

- ☐ Goed
- ☐ Nie baie goed nie
- ☐ Sleg
- ☐ Baie sleg

15. Om te speel?

- ☐ Nooit
- ☐ Soms
- ☐ Gereeld

Gedurende die tyd voel my kind:

- ☐ Goed
- ☐ Nie baie goed nie
- ☐ Sleg
- ☐ Baie sleg

16. Om vir 'n lang ruk te hardloop of te loop, met uithou vermoë?

- ☐ Nooit
- ☐ Soms
- ☐ Gereeld

Gedurende die tyd voel my kind:

- ☐ Goed
- ☐ Nie baie goed nie
- ☐ Sleg
- ☐ Baie sleg

17. Om te balanseer?

- ☐ Nooit
- ☐ Soms
- ☐ Gereeld

Gedurende die tyd voel my kind:

- ☐ Goed
- ☐ Nie baie goed nie
- ☐ Sleg
- ☐ Baie sleg

18. Om iets vaardig en vinnig te doen?
    - ☐ Nooit
    - ☐ Soms
    - ☐ Gereeld

Gedurende die tyd voel my kind:
- ☐ Goed
- ☐ Nie baie goed nie
- ☐ Sleg
- ☐ Baie sleg

19. *Slegs as u kind probleme van die aard in die vorige weke gehad het:*
    Wat dink u kon die oorsaak gewees het?

    _____

Goed waarmee jou kind probleme gehad het in die vorige weke?

Probeer onthou hoe jou kind in die vorige weke was? Het hy/sy probleme gehad om .....

20. Skool toe te gaan op sy/haar eie?
    - ☐ Nooit
    - ☐ Soms
    - ☐ Gereeld

Gedurende die tyd voel my kind:
- ☐ Goed
- ☐ Nie baie goed nie
- ☐ Sleg
- ☐ Baie sleg

21. Hom/haarself te bad/was?
    - ☐ Nooit
    - ☐ Soms
    - ☐ Gereeld

Gedurende die tyd voel my kind:
- ☐ Goed
- ☐ Nie baie goed nie
- ☐ Sleg
- ☐ Baie sleg

22. Om hom/haarself aan te trek?
    - ☐ Nooit
    - ☐ Soms
    - ☐ Gereeld

    Gedurende die tyd voel my kind:
    - ☐ Goed
    - ☐ Nie baie goed nie
    - ☐ Sleg
    - ☐ Baie sleg

23. Om op sy/haar eie die toilet te gebruik?

    - ☐ Nooit
    - ☐ Soms
    - ☐ Gereeld

    Gedurende die tyd voel my kind:
    - ☐ Goed
    - ☐ Nie baie goed nie
    - ☐ Sleg
    - ☐ Baie sleg

24. Om op hul eie te eet?
    - ☐ Nooit
    - ☐ Soms
    - ☐ Gereeld

    Gedurende die tyd voel my kind:
    - ☐ Goed
    - ☐ Nie baie goed nie
    - ☐ Sleg
    - ☐ Baie sleg

25. Om op hul eie te speel of aan sport deel te neem?

    - ☐ Nooit
    - ☐ Soms
    - ☐ Gereeld

    Gedurende die tyd voel my kind:
    - ☐ Goed
    - ☐ Nie baie goed nie
    - ☐ Sleg
    - ☐ Baie sleg

26. Om hul stokperdjie op hul eie te beoefen?
    - ☐ Nooit
    - ☐ Soms
    - ☐ Gereeld

    Gedurende die tyd voel my kind:
    - ☐ Goed
    - ☐ Nie baie goed nie
    - ☐ Sleg
    - ☐ Baie sleg

27. Om fiets te ry?
    - ☐ Nooit
    - ☐ Soms
    - ☐ Gereeld

    Gedurende die tyd voel my kind:
    - ☐ Goed
    - ☐ Nie baie goed nie
    - ☐ Sleg
    - ☐ Baie sleg

28. *Slegs as jou kind probleme van die aard in die vorige weke gehad het:*
    Wat dink jy kon die oorsaak gewees het?
    _____

Goed waarmee u kind probleme gehad het in die vorige weke?

Probeer onthou hoe u kind in die vorige weke was? Het hy/sy probleme gehad om .....

29. Om te konsentreer?
    - ☐ Nooit
    - ☐ Soms
    - ☐ Gereeld

    Gedurende die tyd voel my kind:
    - ☐ Goed
    - ☐ Nie baie goed nie
    - ☐ Sleg
    - ☐ Baie sleg

30. Om die skool werk te verstaan?
    - ☐ Nooit
    - ☐ Soms
    - ☐ Gereeld

Gedurende die tyd voel my kind:

- ☐ Goed
- ☐ Nie baie goed nie
- ☐ Sleg
- ☐ Baie sleg

31. Om te verstaan wat ander sê?

- ☐ Nooit
- ☐ Soms
- ☐ Gereeld

Gedurende die tyd voel my kind:

- ☐ Goed
- ☐ Nie baie goed nie
- ☐ Sleg
- ☐ Baie sleg

32. Wiskunde te doen?

- ☐ Nooit
- ☐ Soms
- ☐ Gereeld

Gedurende die tyd voel my kind:

- ☐ Goed
- ☐ Nie baie goed nie
- ☐ Sleg
- ☐ Baie sleg

33. Om te lees?

- ☐ Nooit
- ☐ Soms
- ☐ Gereeld

Gedurende die tyd voel my kind:

- ☐ Goed
- ☐ Nie baie goed nie
- ☐ Sleg
- ☐ Baie sleg

34. Om te skryf?

- ☐ Nooit
- ☐ Soms
- ☐ Gereeld

Gedurende die tyd voel my kind:

- ☐ Goed
- ☐ Nie baie goed nie
- ☐ Sleg
- ☐ Baie sleg

35. Om te leer?

- ☐ Nooit
- ☐ Soms
- ☐ Gereeld

Gedurende die tyd voel my kind:

- ☐ Goed
- ☐ Nie baie goed nie
- ☐ Sleg
- ☐ Baie sleg

36. Om te sê wat hy/sy bedoel?

- ☐ Nooit
- ☐ Soms
- ☐ Gereeld

Gedurende die tyd voel my kind:

- ☐ Goed
- ☐ Nie baie goed nie
- ☐ Sleg
- ☐ Baie sleg

37. *Slegs as u kind probleme van die aard in die vorige weke gehad het:*
Wat dink u kon die oorsaak gewees het?
_____

Hantering van ander kinds in die vorige weke.
Probeer onthou hoe u kind in die vorige weke was.

38. My kind kon maklik speel en praat met ander kinders.
    - ☐ Ja
    - ☐ Bietjie
    - ☐ Nooit

Gedurende die tyd voel my kind:
- ☐ Goed
- ☐ Nie baie goed nie
- ☐ Sleg
- ☐ Baie sleg

39. My kind kon vir hom/haarself opstaan
    - ☐ Ja
    - ☐ Bietjie
    - ☐ Nooit

Gedurende die tyd voel my kind:
- ☐ Goed
- ☐ Nie baie goed nie
- ☐ Sleg
- ☐ Baie sleg

40. Ander kinders het my kind gevra om met hulle te speel
    - ☐ Ja
    - ☐ Bietjie
    - ☐ Nooit

Gedurende die tyd voel my kind:
- ☐ Goed
- ☐ Nie baie goed nie
- ☐ Sleg
- ☐ Baie sleg

41. My kind was gemaklik met ander kinders
    - ☐ Ja
    - ☐ Bietjie
    - ☐ Nooit

Gedurende die tyd voel my kind:
- ☐ Goed
- ☐ Nie baie goed nie
- ☐ Sleg
- ☐ Baie sleg

42. My kind was gemaklik om met ons as ouers te speel en gesels

- ☐ Ja
- ☐ Bietjie
- ☐ Nooit

Gedurende die tyd voel my kind:

- ☐ Goed
- ☐ Nie baie goed nie
- ☐ Sleg
- ☐ Baie sleg

43. My kind wou nie met ons as ouers kommunikeer nie

- ☐ Nooit
- ☐ Soms
- ☐ Gereeld

Gedurende die tyd voel my kind:

- ☐ Goed
- ☐ Nie baie goed nie
- ☐ Sleg
- ☐ Baie sleg

44. My kind was rusteloos en ongeduldig met ons as ouers

- ☐ Nooit
- ☐ Soms
- ☐ Gereeld

Gedurende die tyd voel my kind:

- ☐ Goed
- ☐ Nie baie goed nie
- ☐ Sleg
- ☐ Baie sleg

45. My kind was uitdagend teenoor ons as ouers

- ☐ Nooit
- ☐ Soms
- ☐ Gereeld

Gedurende die tyd voel my kind:

- ☐ Goed
- ☐ Nie baie goed nie
- ☐ Sleg
- ☐ Baie sleg

46. As dinge nie altyd goed genoeg was met die hantering van ander kinds of met u nie.

    Wat dink jy was die rede?

    _____

In die vorige weke was my kind .....

47. Vrolik
    - ☐ Nooit
    - ☐ Soms
    - ☐ Gereeld

48. Hartseer
    - ☐ Nooit
    - ☐ Soms
    - ☐ Gereeld

49. In ‘n goeie luim/bui
    - ☐ Nooit
    - ☐ Soms
    - ☐ Gereeld

50. Kwaad
    - ☐ Nooit
    - ☐ Soms
    - ☐ Gereeld

51. Tevrede
    - ☐ Nooit
    - ☐ Soms
    - ☐ Gereeld

52. Bekommerd
    - ☐ Nooit
    - ☐ Soms
    - ☐ Gereeld

53. Entoesiasties
    - ☐ Nooit
    - ☐ Soms
    - ☐ Gereeld

54. Bedruk

- ☐ Nooit
- ☐ Soms
- ☐ Gereeld

55. Ontspanne

- ☐ Nooit
- ☐ Soms
- ☐ Gereeld

56. Aggressief

- ☐ Nooit
- ☐ Soms
- ☐ Gereeld

57. Gelukkig

- ☐ Nooit
- ☐ Soms
- ☐ Gereeld

58. Humeurig/ /Kort van draad

- ☐ Nooit
- ☐ Soms
- ☐ Gereeld

59. Vol selfvertroue

- ☐ Nooit
- ☐ Soms
- ☐ Gereeld

60. Jaloers

- ☐ Nooit
- ☐ Soms
- ☐ Gereeld

61. Gelukkig

- ☐ Nooit
- ☐ Soms
- ☐ Gereeld

62. Angstig

- ☐ Nooit
- ☐ Soms
- ☐ Gereeld

63. *Indien u kind enige van die gevoelens gehad het in die vorige weke:*
Wat was die rede hiervoor

_____

Die die einde van die vraelys

Dankie vir die voltooiing daarvan!!

TAPQOL

Imibuzo
Questionnaire
Imibuzo yabazali abanabantwana abanonyaka omnye 1 ukuya kweyesihlanu 5
for parents of children aged 1 to 5

Uyacelwa uphendule lemibuzo ilandelayo kuqala.
Please answer the following questions first.

Ingaba umntwana omphendulela le mibuzo uyinkwenkwe okanye yintombazana?
Is the child for whom you are completing this questionnaire a boy or a girl?

Nkwenkwe. boy ☐

ntombazana. girl ☐

Uthini unyaka wakhe wokuzalwa?
What is the child's date of birth?

....

(**umhla**) (**inyanga**) (**unyaka**)

(day) (month) (year)

Uthini umhla ophendula ngawo lemibuzo?
On what date are you completing this questionnaire?

....

(**umhla**) (**inyanga**) (**unyaka**)

(day) (month) (year)

LUMC

TNO

IMIYALELO : INSTRUCTIONS

Mnumzana/ Nkosazana ebekekileyo
Dear Sir / Madam,

Imibuzo ekoluphando imayelana nemiba eyohlukeneyo engempilo yomntwana wakho.
The questions in this survey pertain to different aspects of your child's health.

Nceda uphendule imibuzo ngokuthi ubeke u X kwibhokisi enika inkcazelo malunga nomntwana wakho.
Please answer the questions by placing an X in the box next to the response that best describes your child.

Umzekelo
For example:

Ingaba umntwana wakho ukhe wanendlebe eqaqambayo kwezinyanga zintathu 3 zidlulilleyo?

Has your child had an earache in the last 3 months?

1 **Indlebe eqaqambayo** ☒ **Zange** ☐ **ngamanye amaxesha** ☐ **Rhoqo**
Earache never occasionally often

Ngalo maxesha, umntwana wam ebeziva:
At those times, my child felt:

Ukuba umntwana wakho akazange abenendlebe eqaqambayo nje ngalomzekelo ungentla, nceda uphendule umbuzo olandelayo.
If your child never had an earache, as in the above example, please go to the next question.

Ukuba umntwana wakho ubanedlebe eqaqambayo 'ngamanye amaxesha' okanye 'rhoqo', nceda ufake u X ecaleni kweempendulo ezo. Ngaphantsi kwezimpendulo zimbini uzakufumana inkcazo ethi " Ngalo maxhesha, umntwana wam ebeziva" Bonisa indlela umntwana wakho ebeziva ngayo.
Umzekelo:
If your child had an earache 'occasionally' or 'often', please place an X by one of those answers. Just below these two answers you will find the statement beginning with "At those times, my child felt". Indicate there how your child felt. For example:

Ingaba umntwana wakho ukhe wanendlebe eqaqambayo kwezinyanga zintathu 3 zidlulileyo?
Has your child had an earache in the last 3 months?

Indlebe eqaqambayo ☐ **zange** ☒ **ngamanye amaxesha** ☐ **rhoqo**
Earache never occasionally often

Ngalo maxesha, umntwana wam ebeziva:
At those times, my child felt

☐ **kakuhle** ☐ **Hayi kakuhle** ☒ **Hayi kamnandi** ☐ **hayi kamnandi kakhulu**
well not very well unwell very unwell

Gqithela kumbuzo olandelayo.
Then go to the next question.

Konke oku kungentla ibingumzekelo.
This was an example.

Imibuzo eyiyo iqala kwiphepha lilandelayo.
The questionnaire starts on the next page.

Kwezinyanga zintathu zigqithileyo umntwana wakho ebekhe wane:
In the last 3 months has your child had:

---

1 **Sisu esibuhlungu okanye iintlungu zesisu**
Stomach ache or abdominal pain

☐ zange ☐ngamanye amaxesha ☐rhoqo
never occasionally often

Ngalo maxesha, umntwana wam ebeziva:
At those times, my child felt:

☐ **kakuhle** ☐ **Hayi kakuhle** ☐ **Hayi kamnandi** ☐ **Hayi kamnandi kakhulu**
Well not very well unwell very unwell

---

2 **Iintlungu zesisu**
Colic (abdominal cramps)

☐ **zange** ☐ **Ngamanye amaxesha** ☐ **rhoqo**
never occasionally often

Ngalo maxesha, umntwana wam ebeziva:
At those times, my child felt

☐ **kakuhle** ☐ **Hayi kakuhle** ☐ **Hayi kamnandi** ☐ **Hayi kamnandi kakhulu**
Well not very well unwell very unwell

---

3 **Ikhwekhwe**
Eczema

☐ **zange** ☐ **Ngamanye amaxesha** ☐ **rhoqo**
never occasionally often

Ngalo maxesha, umntwana wam ebeziva:
At those times, my child felt

☐ **kakuhle** ☐ **hayi kakuhle** ☐ **hayi kamnandi** ☐ **hayi kamnandi kakhulu**
Well not very well unwell very unwell

---

4 **Ukurhawuzelela**
Itching

☐ **zange** ☐ **Ngamanye amaxesha** ☐ **rhoqo**
never occasionally often

Ngalo maxesha, umntwana wam ebeziva:
At those times, my child felt

☐ **kakuhle** ☐ **hayi kakuhle** ☐ **hayi kamnandi** ☐ **hayi kamnandi kakhulu**
Well not very well unwell very unwell

---

5 **Ulusu olomileyo**
Dry skin

☐ **zange** ☐ **ngamanye amaxesha** ☐ **rhoqo**
never occasionally often

Ngaloo maxesha, umntwana wam ebeziva:

At those times, my child felt

☐ **kakuhle** ☐ **hayi kakuhle** ☐ **hayi kamnandi** ☐ **hayi kamnandi kakhulu**
Well not very well unwell very unwell

6 **Iphika**
Bronchitis

☐ **zange** ☐ **Ngamanye amaxesha** ☐ **rhoqo**
never occasionally often

Ngalo maxesha, umntwana wam ebeziva:
At those times, my child felt

☐ **kakuhle** ☐ **hayi kakuhle** ☐ **hayi kamnandi** ☐ **hayi kamnandi kakhulu**
Well not very well unwell very unwell

---

7 **Ukuphefumla nzima okanye ingxaki yemiphunga**
Difficulty breathing or lung problems

☐ **zange** ☐ **Ngamanye amaxesha** ☐ **rhoqo**
never occasionally often

Ngalo maxesha, umntwana wam ebeziva:
At those times, my child felt

☐ **kakuhle** ☐ **hayi kakuhle** ☐ **hayi kamnandi** ☐ **hayi kamnandi kakhulu**
Well not very well unwell very unwell

---

8 **Kwezinyanga zintathu zigqithileyo umntwana wakho ebekhe wane:**
In the last 3 months has your child had:

Ukuqhawukelwa ngumphefumlo
Shortness of breath

☐ **zange** ☐ **Ngamanye amaxesha** ☐ **rhoqo**
never occasionally often

Ngalo maxesha, umntwana wam ebeziva:
At those times, my child felt

☐ **kakuhle** ☐ **hayi kakuhle** ☐ **hayi kamnandi** ☐ **hayi kamnandi kakhulu**
Well not very well unwell very unwell

---

9 **Isizaphuzaphu**
Nausea

☐ **zange** ☐ **Ngamanye amaxesha** ☐ **rhoqo**
never occasionally often

Ngalo maxesha, umntwana wam ebeziva:
At those times, my child felt

☐ **kakuhle** ☐ **hayi kakuhle** ☐ **hayi kamnandi** ☐ **hayi kamnandi kakhulu**
Well not very well unwell very unwell

Ingaba umntwana wakho ulelinjani kwezinyaga zintathu zigqithileyo?
How did your child sleep over the last 3 months?

---

10 **Ingaba untwana wakho ulala kakubi eguqugugquka?**
Did your child sleep restlessly?

☐ **zange** ☐ **Ngamanye amaxesha** ☐ **rhoqo**
never occasionally often

Ngalo maxesha, umntwana wam ebeziva:
At those times, my child felt

☐ **kakuhle** ☐ **hayi kakuhle** ☐ **hayi kamnandi** ☐ **hayi kamnandi kakhulu**
Well not very well unwell very unwell

---

11 **Ingaba umntwana wakho akalali ebusuku?**
Did your child lie awake at night?

☐ **zange** ☐ **Ngamanye amaxesha** ☐ **rhoqo**
never occasionally often

Ngalo maxesha, umntwana wam ebeziva:
At those times, my child felt

☐ **kakuhle** ☐ **hayi kakuhle** ☐ **hayi kamnandi** ☐ **hayi kamnandi kakhulu**
Well not very well unwell very unwell

---

12 **Ingaba umntwana wakho uyakhala ebusuku?**
Did your child cry during the night?

☐ **zange** ☐ **Ngamanye amaxesha** ☐ **rhoqo**
never occasionally often

Ngalo maxesha, umntwana wam ebeziva:
At those times, my child felt

☐ **kakuhle** ☐ **hayi kakuhle** ☐ **hayi kamnandi** ☐ **hayi kamnandi kakhulu**
Well not very well unwell very unwell

---

13 **Ingaba umntwana wakho unengxaki yokulala ebusuku?**
Did your child have trouble sleeping through the night?

☐ **zange** ☐ **Ngamanye amaxesha** ☐ **rhoqo**
never occasionally often

Ngalo maxesha, umntwana wam ebeziva:
At those times, my child felt

☐ **kakuhle** ☐ **hayi kakuhle** ☐ **hayi kamnandi** ☐ **hayi kamnandi kakhulu**
Well not very well unwell very unwell

Ingaba umtnwana wakho ebesitya, awasele njani amanzi kwezinyanga zintathu 3 zigqithileyo?
How did your child eat and drink over the last 3 months?

---

14 **Ingaba umntwana wakho akakucacelanga ukutya?**
Did your child have poor appetite?

☐ **zange** ☐ **Ngamanye amaxesha** ☐ **rhoqo**
never occasionally often

Ngalo maxesha, umntwana wam ebeziva:
At those times, my child felt

☐ **kakuhle** ☐ **hayi kakuhle** ☐ **hayi kamnandi** ☐ **hayi kamnandi kakhulu**
Well not very well unwell very unwell

---

15 **Ingaba umntwana wakho uyanzinyelwa kukutya ngokwaneleyo?**
Did your child have difficulty eating enough

☐ **zange** ☐ **Ngamanye amaxesha** ☐ **rhoqo**
never occasionally often

Ngalo maxesha, umntwana wam ebeziva:
At those times, my child felt

☐ **kakuhle** ☐ **hayi kakuhle** ☐ **hayi kamnandi** ☐ **hayi kamnandi kakhulu**
Well not very well unwell very unwell

---

16 **Ingaba umntwana wakho akakufuni ukutya?**
Did your child refuse to eat?

☐ **zange** ☐ **Ngamanye amaxesha** ☐ **rhoqo**
never occasionally often

Ngalo maxesha, umntwana wam ebeziva:
At those times, my child felt

☐ **kakuhle** ☐ **hayi kakuhle** ☐ **hayi kamnandi** ☐ **hayi kamnandi kakhulu**
Well not very well unwell very unwell

Ingaba umntwana wakho ebeziphathe njani kwezinyanga zintathu 3 zigqithileyo?
How was your child's behaviour over the last 3 months?

---

17 **Umntwana wam ebenomsindo okhawulezayo**
My child was short tempered

☐ **zange** ☐ **ngamanye amaxesha** ☐ **rhoqo**
never occasionally often

---

18 **Umntwana wam ebendlongo-ndlongo**
My child was aggressive

☐ **zange** ☐ **ngamanye amaxesha** ☐ **rhoqo**
never occasionally often

---

19 **Umntwana wam ebedikwa msinyane**
My child was fussy, irritated

☐ **zange** ☐ **ngamanye amaxesha** ☐ **rhoqo**
never occasionally often

---

20 **Umntwana wam ebenomsindo**
My child was angry

☐ **zange** ☐ **ngamanye amaxesha** ☐ **rhoqo**
never occasionally often

---

21 **Umntwana wam ebeneenkani kum**
My child was restless or impatient with me

☐ **zange** ☐ **ngamanye amaxesha** ☐ **rhoqo**
never occasionally often

---

22 **Umntwana wam akazoli okanye akanamonde**
My child was rebellious/defiant with me

☐ **zange** ☐ **ngamanye amaxesha** ☐ **rhoqo**
never occasionally often

23 **Bendingakwazi ukumlawula umntwana wam**
I could not manage my child

☐ **zange** ☐ **ngamanye amaxesha** ☐ **rhoqo**
never occasionally often

Ebekwimo enjani umntwana wakho kwezinyanga zintathu 3 zidlulileyo?
How was your child's mood in the last 3 months?

24	**Kwimo echwayitileyo** Cheerful	☐ **zange** never	☐ **ngamanye amaxesha** occasionally	☐ **rhoqo** often
25	**Ngendlela eyiyo** Content	☐ **zange** never	☐ **ngamanye amaxesha** occasionally	☐ **rhoqo** often
26	**Wonwabile** Happy	☐ **zange** never	☐ **ngamanye amaxesha** occasionally	☐ **rhoqo** often
27	**Esoyika** Fearful	☐ **zange** never	☐ **ngamanye amaxesha** occasionally	☐ **rhoqo** often
28	**Engakhululekanga** Tense	☐ **zange** never	☐ **ngamanye amaxesha** occasionally	☐ **rhoqo** often
29	**Ekhathazekile** Worried	☐ **zange** never	☐ **ngamanye amaxesha** occasionally	☐ **rhoqo** often
30	**Edlamkile** Energetic	☐ **zange** never	☐ **ngamanye amaxesha** occasionally	☐ **rhoqo** often
31	**Ekhuthele** Active	☐ **zange** never	☐ **ngamanye amaxesha** occasionally	☐ **rhoqo** often
32	**Ephilile** Lively	☐ **zange** never	☐ **ngamanye amaxesha** occasionally	☐ **rhoqo** often

Ukuba umntwana wakho ungaphantsi kweenyanga eziyi 18 ubudala, akunyanzelekanga uyiphendule yonke lemibuzo.
If your child is *under* the age of 18 months, you do **not** have to complete the rest of this questionnaire.

Enkosi kakhulu ngentsebenziswano yakho!
Thank you for your co-operation

Ukuba umntwana wakho uneenyanga eziyi 18 ubudala okanye ngaphezulu, uyacelwa uqhubeke ngokuphendula imibuzo elandelayo.
If your child is 18 months of age or older, please continue completing the questions on the following pages.

Ingaba umntwana wakho ebeziphathe njani phakathi kwabanye abantwana kwezinyanga zintathu 3 zigqithileyo?
How was your child's behaviour with other children over the last 3 months?

---

33 **Umntwana wam ebedlala kakuhle nabanye abantwana**
My child was able to play nicely with other children

☐ **zange** ☐ **ngamanye amaxesha** ☐**rhoqo**
never occasionally often

---

34 **Umntwana wam ebonwabile nabanye abantwana**
My child was at ease with other children

☐ **zange** ☐ **ngamanye amaxesha** ☐**rhoqo**
never occasionally often

---

35 **Umntwana wam ebezithembile nabanye abantwana**
My child was self assured with other children

☐ **zange** ☐ **ngamanye amaxesha** ☐ **rhoqo**
never occasionally often

Kwezinyanga zintathu 3 zigqithileyo, xa uthelekisa nabanye abantwana abantanganye nalo wakho, umntwana wakho ebekhe wa-:
Over the last 3 months, compared with other children of the same age, did your child have:

---

36 **Wanzinyelwa kukuhamba?**
Difficulty walking

☐ **hayi** ☐ **ewe, kancinci** ☐ **ewe, kakhulu** ☐ **Akakahambi (okwangoku)**
no yes, a little yes, a lot is not walking (yet)

Ngalo maxesha, umntwana wam ebeziva:

At those times, my child felt

☐ **kakuhle** ☐ **hayi kakuhle** ☐ **hayi kamnandi** ☐**hayi kamnandi kakhulu**
Well not very well unwell very unwell

---

37 **Wanzinyelwa kukubaleka?**
Difficulty running?

☐ **hayi** ☐ **ewe, kancinci** ☐ **ewe, kakhulu** ☐ **Akakahambi (okwangoku)**
no yes, a little yes, a lot is not walking (yet)

Ngalo maxesha, umntwana wam ebeziva:

At those times, my child felt

☐ **kakuhle** ☐ **hayi kakuhle** ☐ **hayi kamnandi** ☐**hayi kamnandi kakhulu**
Well not very well unwell very unwell

---

38 **Wanzinyelwa kukunyuka iziteps ngaphandle kokuncedwa?**
Difficulty climing stairs without help?

☐ **hayi** ☐ **ewe, kancinci** ☐ **ewe, kakhulu** ☐ **Akakahambi (okwangoku)**
no yes, a little yes, a lot is not walking (yet)

Ngalo maxesha, umntwana wam ebeziva:

At those times, my child felt

☐ **kakuhle** ☐ **hayi kakuhle** ☐ **hayi kamnandi** ☐**hayi kamnandi kakhulu**
Well not very well unwell very unwell

40

39 **Wanzinyelwa kukungahexi?**
Difficulty keeping balance?

☐ **hayi** ☐ **ewe, kancinci** ☐ **ewe, kakhulu** ☐ **Akakahambi (okwangoku)**
no yes, a little yes, a lot is not walking (yet)

Ngalo maxesha, umntwana wam ebeziva:

At those times, my child felt

☐ **kakuhle** ☐ **hayi kakuhle** ☐ **hayi kamnandi** ☐**hayi kamnandi kakhulu**
Well not very well unwell very unwell

Kwezinyanga zintathu 3 zigqithileyo, xa uthelekisa nabanye abantwana abantanganye nalo wakho, umntwana wakho ebekhe wa-:
Over the last 3 months, compared with other children of the same age, did your child have:

---

40 **Nzinyelwa kukuqonda ukuba bathini abanye abantwana?**
Difficulty understanding what others were saying?

☐ **zange** ☐ **ngamanye amaxesha** ☐ **rhoqo**
never occasionally often

Ngaloo maxesha, umntwana wam ebeziva:

At those times, my child felt

☐ **kakuhle** ☐ **hayi kakuhle** ☐ **hayi kamnandi** ☐**hayi kamnandi kakhulu**
Well not very well unwell very unwell

---

41 **Nzinyelwa kukuthetha ngokucacileyo?**
Difficulty talking clearly?

☐ **zange** ☐ **ngamanye amaxesha** ☐ **rhoqo**
never occasionally often

Ngaloo maxesha, umntwana wam ebeziva:

At those times, my child felt

☐ **kakuhle** ☐ **hayi kakuhle** ☐ **hayi kamnandi** ☐**hayi kamnandi kakhulu**
Well not very well unwell very unwell

---

42 **Nzinyelwa kukuzivakalisa?**
Difficulty expressing himself/herself?

☐ **zange** ☐ **ngamanye amaxesha** ☐ **rhoqo**
never occasionally often

Ngaloo maxesha, umntwana wam ebeziva:

At those times, my child felt

☐ **kakuhle** ☐ **hayi kakuhle** ☐ **hayi kamnandi** ☐**hayi kamnandi kakhulu**
Well not very well unwell very unwell

---

43 **Nzinyelwa kukuchaza into ayifunayo?**
Difficulty explaining what he/she wants?

☐ **zange** ☐ **ngamanye amaxesha** ☐ **rhoqo**
never occasionally often

Ngaloo maxesha, umntwana wam ebeziva:

At those times, my child felt

☐ **kakuhle** ☐ **hayi kakuhle** ☐ **hayi kamnandi** ☐**hayi kamnandi kakhulu**
Well not very well unwell very unwell

Imibuzo iphela apha.
This is the end of the questionnaire.
Enkosi ngokuphendula!
Thank you for completing it!

Number: [_ _ _ _ _ _ _ _]

TACQOL

Imibuzo
Questionnaire

Imibuzo yabazali/ abagcini babantwana abaneminyaka esithandathu 6 ukuya kwishumi elinesihlanu 15
for parents / carers of children aged 6 to 15

Uyacelwa uphendule lemibuzo ilandelayo kuqala?
Would you please answer the following questions first?

Ingaba umntwana omphendulela le mibuzo uyinkwenkwe okanye yintombazana?
Is the child for whom you are completing this questionnaire a boy or a girl?

Nkwenkwe. boy ☐

ntombazana. girl ☐

Uthini unyaka wakhe wokuzalwa?
What is the child's date of birth?

....

(**umhla**) (**inyanga**) (**unyaka**)

(day) (month) (year)

Uthini umhla ophendula ngawo lemibuzo?
On what date are you completing this questionnaire?

....

(**umhla**) (**inyanga**) (**unyaka**)

(day) (month) (year)

LUMC TNO

IMIYALELO :INSTRUCTIONS

Mzali obekekileyo
Dear parents,

Sinqwenela ukwazi ukuba ingaba umntwana wakho ebeziva njani kweziveki zidlulileyo.
We wish to know how your child has been in recent weeks.

Kumaphepha alandelayo, uzakufumana iqela lemibuzo.
On the pages which follow, you will find a number of questions.

Kukho iqela leempendulo kumbuzo ngamnye.
There are a number of answers for each question.

Khetha eyonampendulo ifanelekileyo yomntwana wakho ufake ungxi X kwibhokise yempendulo.
Choose the answer which is the most appropriate for your child and place a cross in the box alongside that answer.

Umzekelo (Akunyanzelekanga uwuphendule lombuzo):
For example (you do not need to answer this question):

1 **Ingaba umntwana wakho ebekhe wanentloko ebuhlungu?**
Has your child had headaches?

☒ **zange** ☐ **ngamanye amaxesha** ☐ **rhoqo**
never occasionally often

Ngelo xesha, umntwana wam ebeziva:
At that time, my child felt:

☐ **kakuhle** ☐ **Hayi kakuhle** ☐ **Kakubi kakhulu** ☐ **kakubi**
fine not so good quite bad bad

---

2 **Ingaba umntwana wakho ebekhe wanendlebe eqaqambayo okanye umqala obuhlungu?**
Has your child had earaches or sore throats?

☐ **zange** ☒ **ngamanye amaxesha** ☐ **rhoqo**
never occasionally often

Ngelo xesha, umntwana wam ebeziva:
At that time, my child felt:

☐ **kakuhle** ☐ **Hayi kakuhle** ☐ **Kakubi kakhulu** ☐ **kakubi**
fine not so good quite bad bad

Ukuba umntwana wakho akhange abenantloko ibuhlungu kweziveki zigqithileyo, faka ungxi X kwibhokisi ka "zange". Ungagqithela kumbuzo olandelayo ongomqala obuhlungu njengakumzekelo ongentla.
If your child has not suffered from headaches at all in recent weeks, place a cross in the box next to 'never'. You can then go on to the next question about sore throats as in the example above.

Ukuba umntwana wakho ebekhe wanentloko ebuhlungu "ngamanye amaxesha" okanye "rhoqo", faka ungxi X kwibhokisi efanelekileyo. Ngezantsi uzakufumana lamagama: 'ngeloxesha, umntwana wam ebeziva: Ufaka ungxi X ochaza ukuba umntwana wakho ebeziva njani ngokuya ebenentloko ebuhlungu.
If your child had a headache "occasionally" or "often", place a cross in the appropriate box. Below these boxes, you find the words: 'At that time, my child felt:'. You then cross the box stating how your child felt when he or she had a headache.

Umzekelo
For example:

1 **Ingaba umntwana wakho ebekhe wanentloko ebuhlungu?**
Has your child had headaches?

☐ **zange** ☒ **ngamanye amaxesha** ☐ **rhoqo**
never occasionally often

Ngelo xesha, umntwana wam ebeziva:
At that time, my child felt:

☐ **kakuhle** ☐ **Hayi kakuhle** ☐ **Kakubi kakhulu** ☒ **kakubi**
fine not so good quite bad bad

Gqithela kumbuzo olandelayo
You then proceed to the next question.

Lintlungu neempawu kwiiveki ezigqithileyo.
Pain and symptoms in recent weeks.

Zama ukukhumbula ukuba umntwana wakho ebeziva njani kwiiveki ezigqithileyo.
Try to remember how your child was in recent weeks.

---

1 **Ingaba umntwana wakho ebenendlebe eqaqambayo okanye umqala obuhlungu?**
Has your child had earaches or sore throats?

☐ **zange** ☐ **ngamanye amaxesha** ☐ **rhoqo**
never occasionally often

Ngelo xesha, umntwana wam ebeziva:
At that time, my child felt:

☐ **kakuhle** ☐ **Hayi kakuhle** ☐ **Kakubi kakhulu** ☐ **kakubi**
fine not so good quite bad bad

---

2 **Ingaba umntwana wakho ebeneentlungu zesisu okanye iingqaqambo zesisu?**
Has your child had stomach-aches or abdominal pain?

☐ **zange** ☐ **ngamanye amaxesha** ☐ **rhoqo**
never occasionally often

Ngelo xesha, umntwana wam ebeziva:
At that time, my child felt:

☐ **kakuhle** ☐ **Hayi kakuhle** ☐ **Kakubi kakhulu** ☐ **kakubi**
fine not so good quite bad bad

---

3 **Ingaba umntwana wakho ebekhe waqaqanjelwa yintloko?**
Has your child had headaches?

☐ **zange** ☐ **ngamanye amaxesha** ☐ **rhoqo**
never occasionally often

Ngelo xesha, umntwana wam ebeziva:
At that time, my child felt:

☐ **kakuhle** ☐ **Hayi kakuhle** ☐ **Kakubi kakhulu** ☐ **kakubi**
fine not so good quite bad bad

---

4 **Ingaba umntwana wakho ebekhe wanesiyezi?**
Has your child been dizzy?

☐ **zange** ☐ **ngamanye amaxesha** ☐**rhoqo**
never occasionally often

Ngelo xesha, umntwana wam ebeziva:
At that time, my child felt:

☐ **kakuhle** ☐ **Hayi kakuhle** ☐ **Kakubi kakhulu** ☐ **kakubi**
fine not so good quite bad bad

---

5 **Ingaba umntwana wakho ebeziva egula/efuna ukugabha?**
Has your child felt sick/nauseous?

☐ **zange** ☐ **ngamanye amaxesha** ☐**rhoqo**
never occasionally often

Ngelo xesha, umntwana wam ebeziva:
At that time, my child felt:

☐ **kakuhle** ☐ **Hayi kakuhle** ☐ **Kakubi kakhulu** ☐ **kakubi**
fine not so good quite bad bad

---

6 **Ingaba umntwana wakho ebediniwe?**
Was your child tired?

☐ **zange** ☐ **ngamanye amaxesha** ☐**rhoqo**
never occasionally often

Ngelo xesha, umntwana wam ebeziva:
At that time, my child felt:

☐ **kakuhle** ☐ **Hayi kakuhle** ☐ **Kakubi kakhulu** ☐ **kakubi**
fine not so good quite bad bad

---

7 **Ingaba untwaba wakho ebesozela?**
Was your child sleepy?

☐ **zange** ☐ **ngamanye amaxesha** ☐**rhoqo**
never occasionally often

Ngelo xesha, umntwana wam ebeziva:
At that time, my child felt:

☐ **kakuhle** ☐ **Hayi kakuhle** ☐ **Kakubi kakhulu** ☐ **kakubi**
fine not so good quite bad bad

---

8 **Ingaba umntwana wakho ebeziva etyhafile/ecubhukile?**
Was your child dozy/lethargic?

☐ **zange** ☐ **ngamanye amaxesha** ☐ **rhoqo**
never occasionally often

Ngelo xesha, umntwana wam ebeziva:
At that time, my child felt:

☐ **kakuhle** ☐ **Hayi kakuhle** ☐ **Kakubi kakhulu** ☐ **kakubi**
fine not so good quite bad bad

---

9 **Ingaba umntwana wakho ebephethwe ziintlungu okanye ezinye iimpawu zengulo?**
Did your child suffer from pain or other symptoms?

☐ **zange** ☐ **ngamanye amaxesha** ☐**rhoqo**
never occasionally often

Ngelo xesha, umntwana wam ebeziva:
At that time, my child felt:

☐ **kakuhle** ☐ **Hayi kakuhle** ☐ **Kakubi kakhulu** ☐ **kakubi**
fine not so good quite bad bad

Ziintlungu okanye iimpawu ezinjani?
What sort of pains or symptoms?

---

10 ***Kuphela ukuba umntwana wakho ebephethwe ziintlungu okanye iimpawu kweziveki ziphelileyo:***
Only if your child suffered from pains or other symptoms in recent weeks:

Ucinga ukuba zenziwe yintoni ezontlungu okanye ezompawu?
What do you think caused those pains or those symptoms?

Izinto umntwana wakho ebenzinyelwa zizo kweziveki zigqithileyo.
Things which your child had difficulty with in recent weeks.

Zama ukukhumbula ukuba umntwana wakho ebeziva njani kweziveki zigqithileyo. Ingaba ebe…
Try to remember how your child was in recent weeks. Did he or she have...

---

11 **Nzinyelwa kukubaleka?** ☐ **zange** ☐ **ngamanye amaxesha** ☐ **rhoqo**
Difficulty with running? never occasionally often

Ngelo xesha, umntwana wam ebeziva:
At that time, my child felt:

☐ **kakuhle** ☐ **Hayi kakuhle** ☐ **Kakubi kakhulu** ☐ **kakubi**
fine not so good quite bad bad

---

12 **Nzinyelwa kukuhamba?** ☐ **zange** ☐ **ngamanye amaxesha** ☐ **rhoqo**
Difficulty with walking? never occasionally often

Ngelo xesha, umntwana wam ebeziva:
At that time, my child felt:

☐ **kakuhle** ☐ **Hayi kakuhle** ☐ **Kakubi kakhulu** ☐ **kakubi**
fine not so good quite bad bad

---

13 **Nzinyelwa kukuma?** ☐ **zange** ☐ **ngamanye amaxesha** ☐ **rhoqo**
Difficulty with standing? never occasionally often

Ngelo xesha, umntwana wam ebeziva:
At that time, my child felt:

☐ **kakuhle** ☐ **Hayi kakuhle** ☐ **Kakubi kakhulu** ☐ **kakubi**
fine not so good quite bad bad

Nzinyelwa kukuma-ngxi
Difficulty with balance?

---

14 **Nzinyelwa kukwehla ezitepusini**
Difficulty walking downstairs?

☐ **zange** ☐ **ngamanye amaxesha** ☐ **rhoqo**
never occasionally often

Ngelo xesha, umntwana wam ebeziva:
At that time, my child felt:

☐ **kakuhle** ☐ **Hayi kakuhle** ☐ **Kakubi kakhulu** ☐ **kakubi**
fine not so good quite bad bad

---

15 **Nzinyelwa kukudlala?** ☐ **zange** ☐ **ngamanye amaxesha** ☐ **rhoqo**
Difficulty with playing? never occasionally often

Ngelo xesha, umntwana wam ebeziva:
At that time, my child felt:

☐ **kakuhle** ☐ **Hayi kakuhle** ☐ **Kakubi kakhulu** ☐ **kakubi**
fine not so good quite bad bad

---

16 **Nzinyelwa kukubaleka okanye kukuhamba ixesha elide?**
Difficulty with running or walking for long periods, with stamina?

☐ **zange** ☐ **ngamanye amaxesha** ☐ **rhoqo**
never occasionally often

Ngelo xesha, umntwana wam ebeziva:
At that time, my child felt:

☐ **kakuhle** ☐ **Hayi kakuhle** ☐ **Kakubi kakhulu** ☐ **kakubi**
fine not so good quite bad bad

---

17 **Nzinyelwa kukuma-ngxi** ☐ **zange** ☐ **ngamanye amaxesha** ☐ **rhoqo**
Difficulty with balance? never occasionally often

Ngelo xesha, umntwana wam ebeziva:
At that time, my child felt:

☐ **kakuhle** ☐ **Hayi kakuhle** ☐ **Kakubi kakhulu** ☐ **kakubi**
fine not so good quite bad bad

---

18 **Nzinyelwa kukwenza izinto ngezandla okanye msinyane**
Difficulty with doing things handily or quickly?

☐ **zange** ☐ **ngamanye amaxesha** ☐ **rhoqo**
never occasionally often

Ngelo xesha, umntwana wam ebeziva:
At that time, my child felt:

☐ **kakuhle** ☐ **Hayi kakuhle** ☐ **Kakubi kakhulu** ☐ **kakubi**
fine not so good quite bad bad

19 **Kuphela ukuba umntwana wakho ebenezingxaki zifana nezi kweziveki zigqithileyo**
Only if your child had problems of this kind in recent weeks:

Ucinga ukuba zenziwe yintoni ezingxaki?
What do you think caused these problems?

Izinto umntwana wakho ebenzinyelwa zizo kweziveki zigqithileyo.
Things which your child had difficulty with in recent weeks.

Zama ukukhumbula ukuba umntwana wakho ebeziva njani kweziveki zigqithileyo. Ingaba ebe…
Try to remember how your child was in recent weeks. Did he or she have...

---

20 **Nzinyelwa kukuziyela esikolweni ngokunokwakhe?**
Difficulty with going to school on his/her own?

☐ **zange** ☐ **ngamanye amaxesha** ☐ **rhoqo**
never occasionally often

Ngelo xesha, umntwana wam ebeziva:
At that time, my child felt:

☐ **kakuhle** ☐ **Hayi kakuhle** ☐ **Kakubi kakhulu** ☐ **kakubi**
fine not so good quite bad bad

---

20 **Nzinyelwa kukuzihlamba**
Difficulty washing himself/herself?

☐ **zange** ☐ **ngamanye amaxesha** ☐ **rhoqo**
never occasionally often

Ngelo xesha, umntwana wam ebeziva:
At that time, my child felt:

☐ **kakuhle** ☐ **Hayi kakuhle** ☐ **Kakubi kakhulu** ☐ **kakubi**
fine not so good quite bad bad

---

21 **Unzinyelwa kukuzinxibisa?**
Difficulty getting dressed on his/her own?

☐ **zange** ☐ **ngamanye amaxesha** ☐ **rhoqo**
never occasionally often

Ngelo xesha, umntwana wam ebeziva:
At that time, my child felt:

☐ **kakuhle** ☐ **Hayi kakuhle** ☐ **Kakubi kakhulu** ☐ **kakubi**
fine not so good quite bad bad

---

23 **Nzinyelwa kukuziyela ngasese?**
Difficulty going to the lavatory on his/her own?

☐ **zange** ☐ **ngamanye amaxesha** ☐ **rhoqo**
never occasionally often

Ngelo xesha, umntwana wam ebeziva:
at time, my child felt:

---

24 **Unzinyelwa kukuzityela okanye ukuziselela?**
Difficulty with eating or drinking on his/her own?

☐ **zange** ☐ **ngamanye amaxesha** ☐ **rhoqo**
never occasionally often

Ngelo xesha, umntwana wam ebeziva:
At that time, my child felt:

☐ **kakuhle** ☐ **Hayi kakuhle** ☐ **Kakubi kakhulu** ☐ **kakubi**
fine not so good quite bad bad

---

25 **Unzinyelwa kukuya kudlala ngokunokwakhe?**
Difficulty with sports or going out to play on his/her own?

☐ **zange** ☐ **ngamanye amaxesha** ☐ **rhoqo**
never occasionally often

Ngelo xesha, umntwana wam ebeziva:
At that time, my child felt:

☐ **kakuhle** ☐ **Hayi kakuhle** ☐ **Kakubi kakhulu** ☐ **kakubi**
fine not so good quite bad bad

---

26 **Nzinyelwa kukwenza izinto azithandayo?**
Difficulty with doing hobbies on his/her own?

☐ **zange** ☐ **ngamanye amaxesha** ☐ **rhoqo**
never occasionally often

Ngelo xesha, umntwana wam ebeziva:
At that time, my child felt:

☐ **kakuhle** ☐ **Hayi kakuhle** ☐ **Kakubi kakhulu** ☐ **kakubi**
fine not so good quite bad bad

---

27 **Nzinyelwa kukukhwela ibhayisekile?**
Difficulty with riding a bicycle?

☐ **zange** ☐ **ngamanye amaxesha** ☐ **rhoqo**
never occasionally often

Ngelo xesha, umntwana wam ebeziva:
At that time, my child felt:

☐ **kakuhle** ☐ **Hayi kakuhle** ☐ **Kakubi kakhulu** ☐ **kakubi**
fine not so good quite bad bad

Kuphela ukuba umntwana wakho ebenezingxaki zifana nezi kweziveki zigqithileyo:
Only if your child had problems of this kind in recent weeks:

28 **Ucinga ukuba zenziwe yintoni ezingxaki?**
What do you think caused these problems?

Izinto umntwana wakho ebenzinyelwa zizo kweziveki zigqithileyo.
Things which your child had difficulty with in recent weeks.

Zama ukukhumbula ukuba umntwana wakho ebeziva njani kweziveki zigqithileyo. Ingaba ebe…
Try to remember how your child was in recent weeks. Did he or she have...

---

29 **Nzinyelwa kukuthabatha ingqalelo?**
Difficulty with paying attention, concentrating?

☐ **zange** ☐ **ngamanye amaxesha** ☐ **rhoqo**
never occasionally often

Ngelo xesha, umntwana wam ebeziva:
At that time, my child felt:

☐ **kakuhle** ☐ **Hayi kakuhle** ☐ **Kakubi kakhulu** ☐ **kakubi**
fine not so good quite bad bad

---

30 **Nzinyelwa kukuqonda umsebenzi wesikolo?**
Difficulty understanding schoolwork?

☐ **zange** ☐ **ngamanye amaxesha** ☐ **rhoqo**
never occasionally often

Ngelo xesha, umntwana wam ebeziva:
At that time, my child felt:

☐ **kakuhle** ☐ **Hayi kakuhle** ☐ **Kakubi kakhulu** ☐ **kakubi**
fine not so good quite bad bad

---

31 **Nzinyelwa kukuqonda okuthethwa ngabanye?**
Difficulty understanding what others said?

☐ **zange** ☐ **ngamanye amaxesha** ☐ **rhoqo**
never occasionally often

Ngelo xesha, umntwana wam ebeziva:
At that time, my child felt:

☐ **kakuhle** ☐ **Hayi kakuhle** ☐ **Kakubi kakhulu** ☐ **kakubi**
fine not so good quite bad bad

---

32 **Nzinyelwa sisifuba?**
Difficulty with arithmetic?

☐ **zange** ☐ **ngamanye amaxesha** ☐ **rhoqo**
never occasionally often

Ngelo xesha, umntwana wam ebeziva:
At that time, my child felt:

☐ **kakuhle** ☐ **Hayi kakuhle** ☐ **Kakubi kakhulu** ☐ **kakubi**
fine not so good quite bad bad

---

33 **Nzinyelwa kukufunda incwadi?**
Difficulty with reading?

☐ **zange** ☐ **ngamanye amaxesha** ☐ **rhoqo**
never occasionally often

Ngelo xesha, umntwana wam ebeziva:
At that time, my child felt:

☐ **kakuhle** ☐ **Hayi kakuhle** ☐ **Kakubi kakhulu** ☐ **kakubi**
fine not so good quite bad bad

---

34 **Nzinyelwa kukubhala?** ☐ **zange** ☐ **ngamanye amaxesha** ☐ **rhoqo**
Difficulty with writing? never occasionally often

Ngelo xesha, umntwana wam ebeziva:
At that time, my child felt:

☐ **kakuhle** ☐ **Hayi kakuhle** ☐ **Kakubi kakhulu** ☐ **kakubi**
fine not so good quite bad bad

---

35 **Nzinyelwa kukufunda** ☐ **zange** ☐ **ngamanye amaxesha** ☐ **rhoqo**
Difficulty with learning? never occasionally often

Ngelo xesha, umntwana wam ebeziva:
At that time, my child felt:

☐ **kakuhle** ☐ **Hayi kakuhle** ☐ **Kakubi kakhulu** ☐ **kakubi**
fine not so good quite bad bad

---

36 **Nzinyelwa kukucacisa akuthethileyo?**
Difficulty in saying what he/she meant?

☐ **zange** ☐ **ngamanye amaxesha** ☐ **rhoqo**
never occasionally often

Ngelo xesha, umntwana wam ebeziva:
At that time, my child felt:

☐ **kakuhle** ☐ **Hayi kakuhle** ☐ **Kakubi kakhulu** ☐ **kakubi**
fine not so good quite bad bad

Kuphela ukuba umntwana wakho ebenezingxaki zifana nezi kweziveki zigqithileyo:
Only if your child had problems of this kind in recent weeks:

37 **Ucinga ukuba zenziwe yintoni ezingxaki?**
What do you think caused these problems?

Inkqubiswano nabanye abantwana kwakunye nawe kweziveki zigqithileyo.
Dealings with other children and with you in recent weeks.

Zama ukukhumbula ukuba ebenjani umntwana wakho kweziveki zigqithileyo.
Try to remember how your child was in recent weeks.

---

38 **Umntwana wam ebedlala enwabile nabanye abantwana.**
My child was able to play or talk happily with other children.

☐ **ewe** ☐ **kancinci** ☐ **zange**
Yes too little never

Ngelo xesha, umntwana wam ebeziva:
At that time, my child felt:

☐ **kakuhle** ☐ **Hayi kakuhle** ☐ **Kakubi kakhulu** ☐ **kakubi**
fine not so good quite bad bad

---

39 **Umntwana wam ebezimela phakathi kwabanye abantwana.**
My child was able to stand up for himself/herself with other children.

☐ **ewe** ☐ **kancinci** ☐ **zange**
Yes too little never

Ngelo xesha, umntwana wam ebeziva:
At that time, my child felt:

☐ **kakuhle** ☐ **Hayi kakuhle** ☐ **Kakubi kakhulu** ☐ **kakubi**
fine not so good quite bad bad

---

40 **Abanye abantwana bebecela ukudlala nomntwana wam.**
Other children asked my child to play with them.

☐ **ewe** ☐ **kancinci** ☐ **zange**
Yes too little never

Ngelo xesha, umntwana wam ebeziva:
At that time, my child felt:

☐ **kakuhle** ☐ **Hayi kakuhle** ☐ **Kakubi kakhulu** ☐ **kakubi**
fine not so good quite bad bad

---

41 **Umntwana wam ebonwabile nabanye abantwana.**
My child was at ease with other children.

☐ **ewe** ☐ **kancinci** ☐ **zange**
Yes too little never

Ngelo xesha, umntwana wam ebeziva:
At that time, my child felt:

☐ **kakuhle** ☐ **Hayi kakuhle** ☐ **Kakubi kakhulu** ☐ **kakubi**
fine not so good quite bad bad

---

42 **Umntwana wam ebedlala okanye athethe ngokukhululekileyo nathi bazali bakhe.**
My child was able to play or talk happily with us - the parent(s)

☐ **ewe** ☐ **kancinci** ☐ **zange**
Yes too little never

Ngelo xesha, umntwana wam ebeziva:
At that time, my child felt:

☐ **kakuhle** ☐ **Hayi kakuhle** ☐ **Kakubi kakhulu** ☐ **kakubi**
fine not so good quite bad bad

---

43 **Umntwana wam ebenxibelelana okanye ebethula kuthi bazali bakhe.**
My child was incommunicative or quiet with us - the parent(s)

☐ **ewe** ☐ **kancinci** ☐ **zange**
Yes too little never

Ngelo xesha, umntwana wam ebeziva:
At that time, my child felt:

☐ **kakuhle** ☐ **Hayi kakuhle** ☐ **Kakubi kakhulu** ☐ **kakubi**
fine not so good quite bad bad

---

44 **Umntwana wam ebengazolanga okanye ebenongcwangu kuthi bazali bakhe.**
My child was restless or impatient with us - the parent(s)

☐ **ewe** ☐ **kancinci** ☐ **zange**
Yes too little never

Ngelo xesha, umntwana wam ebeziva:
At that time, my child felt:

☐ **kakuhle** ☐ **Hayi kakuhle** ☐ **Kakubi kakhulu** ☐ **kakubi**
fine not so good quite bad bad

---

45 **Umntwana wam ebengasimameli singabazali bakhe.**
My child was defiant with us -the parent(s)

☐ **ewe** ☐ **kancinci** ☐ **zange**
Yes too little never

Ngelo xesha, umntwana wam ebeziva:
At that time, my child felt:

☐ **kakuhle** ☐ **Hayi kakuhle** ☐ **Kakubi kakhulu** ☐ **kakubi**
fine not so good quite bad bad

Ukuba izinto bezingonelisi kwinkqubiswa kubanye abantwana okanye nawe:
If things were not always satisfactory in dealings with other children or with you:

---

45 **Ucinga ukuba ibiyintoni isizathu?**
What do you think was the reason?

Kwiiveki ezigqithileyo umntwana wam ebeziva..
In recent weeks, my child felt...

47	**Enovuyo** Joyful	☐ **zange** never	☐ **ngamanye amaxesha** occasionally	☐ **rhoqo** often
48	**Ekhathazekile** Sad	☐ **zange** never	☐ **ngamanye amaxesha** occasionally	☐ **rhoqo** often
49	**Echwayitile** In good spirits	☐ **zange** never	☐ **ngamanye amaxesha** occasionally	☐ **rhoqo** often
50	**Enomsindo** Angry	☐ **zange** never	☐ **ngamanye amaxesha** occasionally	☐ **rhoqo** often
51	**Wonelisekile** Contented	☐ **zange** never	☐ **ngamanye amaxesha** occasionally	☐ **rhoqo** often
52	**Enexhala** Worried	☐ **zange** never	☐ **ngamanye amaxesha** occasionally	☐ **rhoqo** often
53	**Enohlombe** Enthusiastic	☐ **zange** never	☐ **ngamanye amaxesha** occasionally	☐ **rhoqo** often
54	**Entshingintshingi** Gloomy	☐ **zange** never	☐ **ngamanye amaxesha** occasionally	☐ **rhoqo** often

55	**Engenaxhala** Relaxed	☐ **zange** never	☐ **ngamanye amaxesha** occasionally	☐ **rhoqo** often
56	**Endlongondlong** Aggressive	☐ **zange** never	☐ **ngamanye amaxesha** occasionally	☐ **rhoqo** often
57	**Wonwabile** Happy	☐ **zange** never	☐ **ngamanye amaxesha** occasionally	☐ **rhoqo** often
58	**Umsindo okhawulezayo** Short-tempered	☐ **zange** never	☐ **ngamanye amaxesha** occasionally	☐ **rhoqo** often
59	**Enokuzithemba** Confident	☐ **zange** never	☐ **ngamanye amaxesha** occasionally	☐ **rhoqo** often
60	**Enomona** Jealous	☐ **zange** never	☐ **ngamanye amaxesha** occasionally	☐ **rhoqo** often
61	**Echwayitile** Cheerful	☐ **zange** never	☐ **ngamanye amaxesha** occasionally	☐ **rhoqo** often
62	**Exhalabile** Anxious	☐ **zange** never	☐ **ngamanye amaxesha** occasionally	☐ **rhoqo** often

Ukuba umntwana wakho ebesoloko engaziva kakuhle kweziveki zigqithileyo:
If your child did not always feel fine in recent weeks:

---

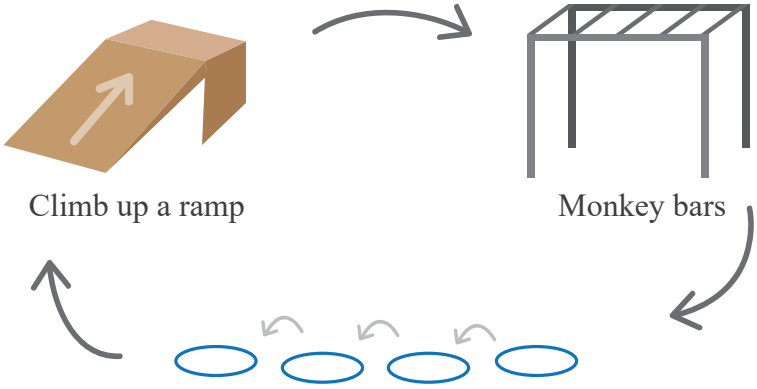
63 **Ibiyintoni isizathu?**
What was the reason?

Iyaphela imibuzo apha.
This is the end of the questionnaire.

Enkso ngokuphendula
Thank you for completing it !

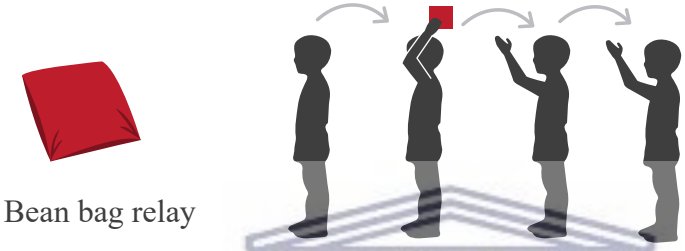
1

15min



2

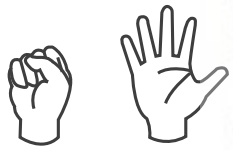
15min



3

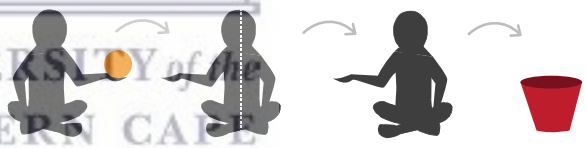
15min

ACTIVITY 1



Warm up fingers x 5

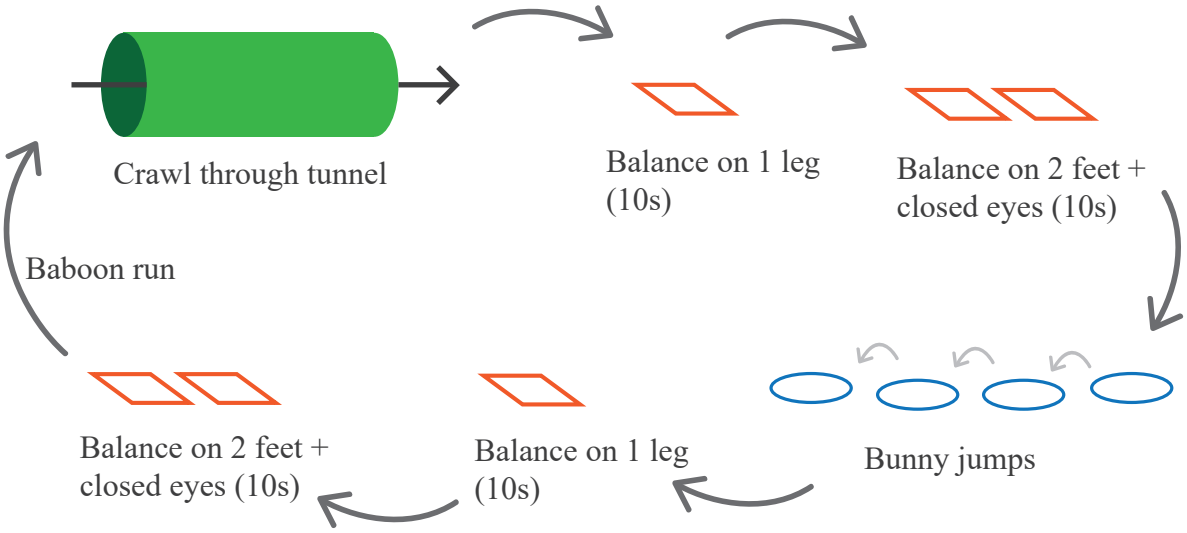
ACTIVITY 2



Midline crossing with ball x 5

4

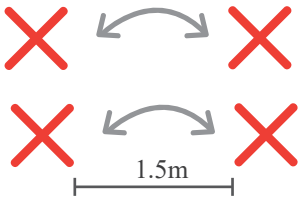
15min



1

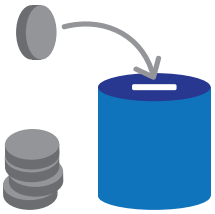
15min

ACTIVITY 1



Ball toss

ACTIVITY 2

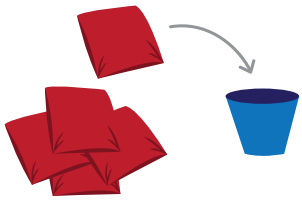


Money box
5 x left hand
5 x right hand

2

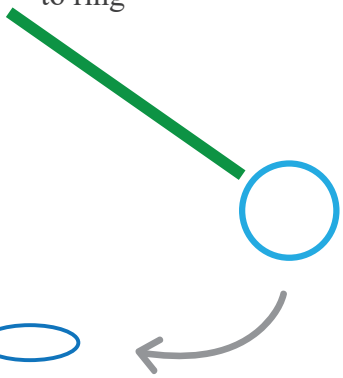
15min

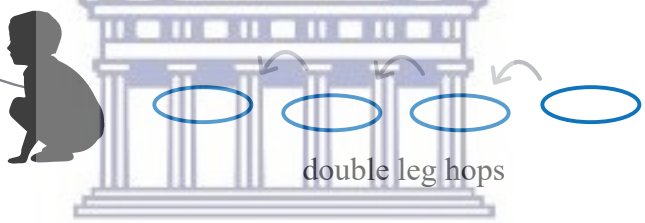
Crawl through tunnel



Throw 5 bean bags
into bucket

Walk heel-to-toe
to ring





double leg hops

Baboon run
to start

3

15min

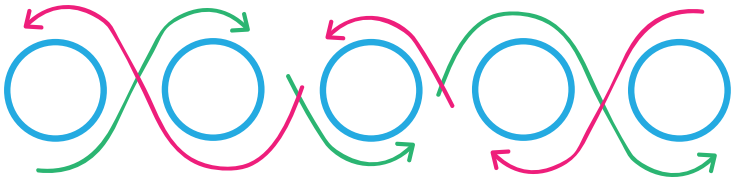
ACTIVITY 1

Walk on a line

Pick up a tennis ball and
walk back on 3m line
holding ball on head

ACTIVITY 2

START

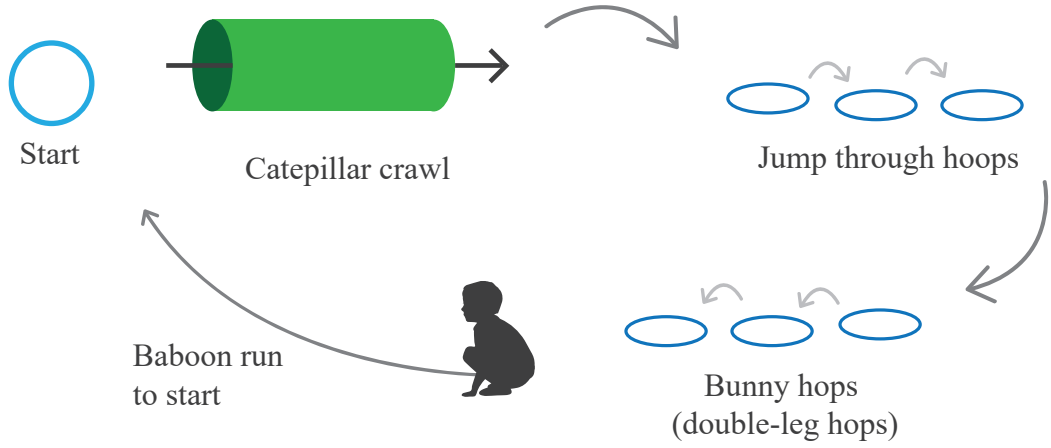


GO BACK

Walk through hoola hoops with bean bag on head and back

1

15min



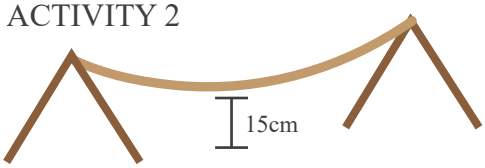
2

15min

ACTIVITY 1

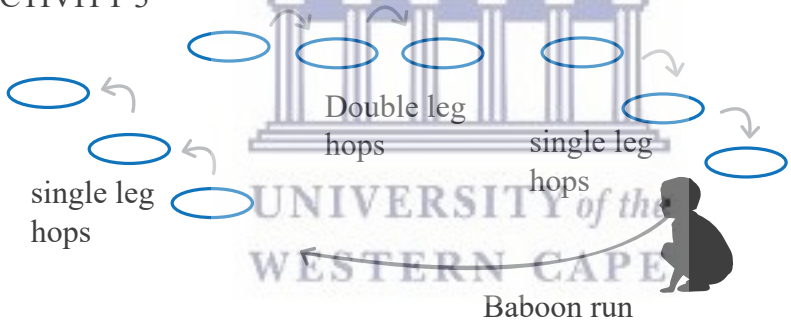
Stringing beads

ACTIVITY 2



5 x double leg jumping rope
5 x single leg jumping rope

ACTIVITY 3

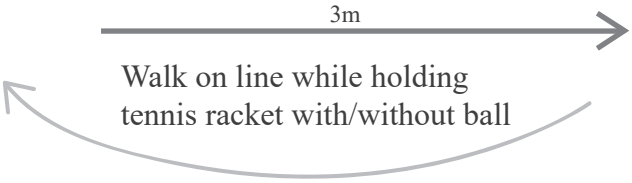


3

15min

ACTIVITY 1

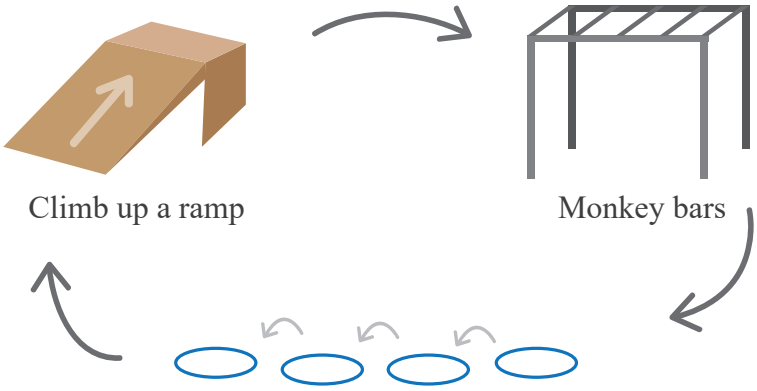
1 - No ball
2 - Big ball
3 - Small ball



ACTIVITY 2

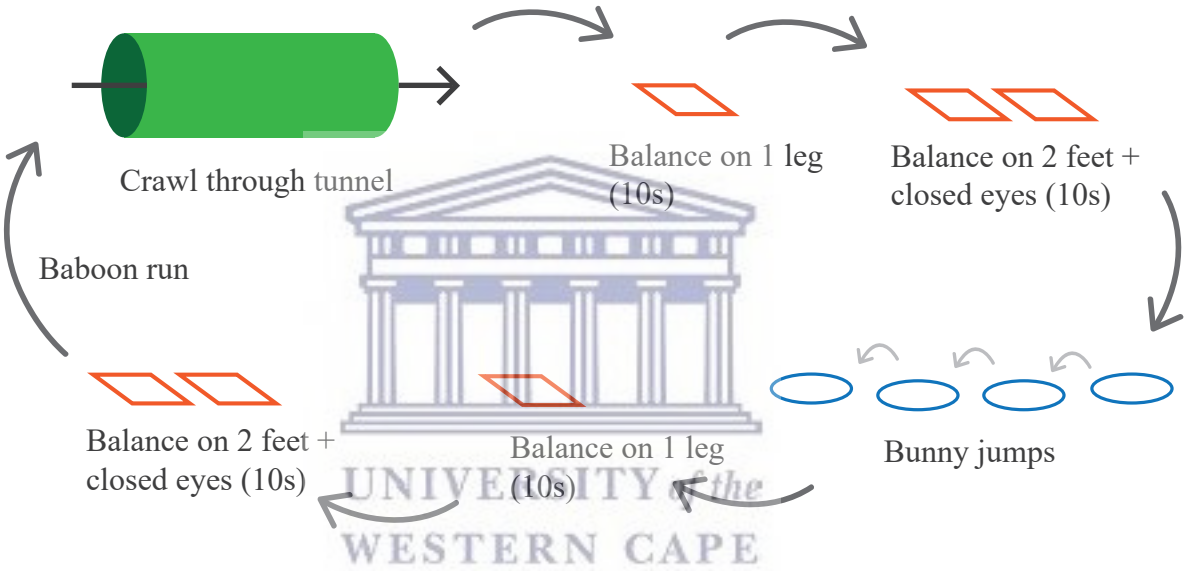
1

15min



2

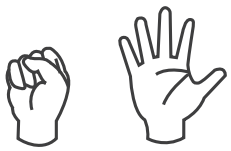
15min



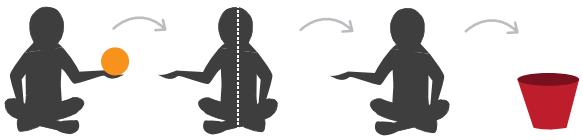
3

15min

ACTIVITY 1



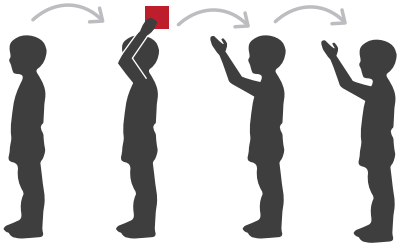
Warm up fingers x 5



Midline crossing with ball x 5

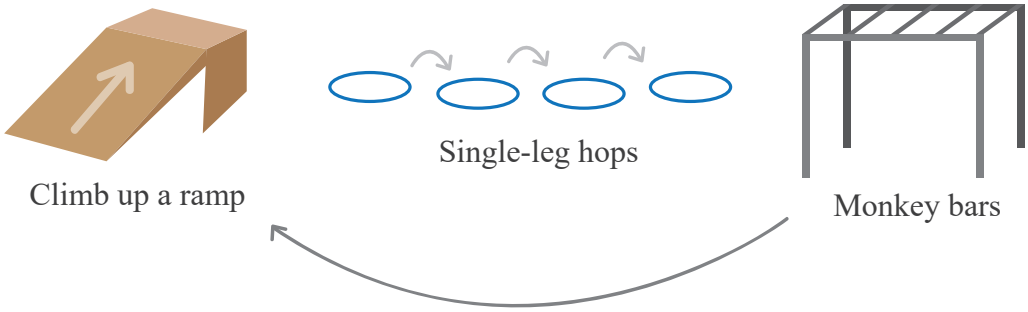
ACTIVITY 2

Bean bag relay



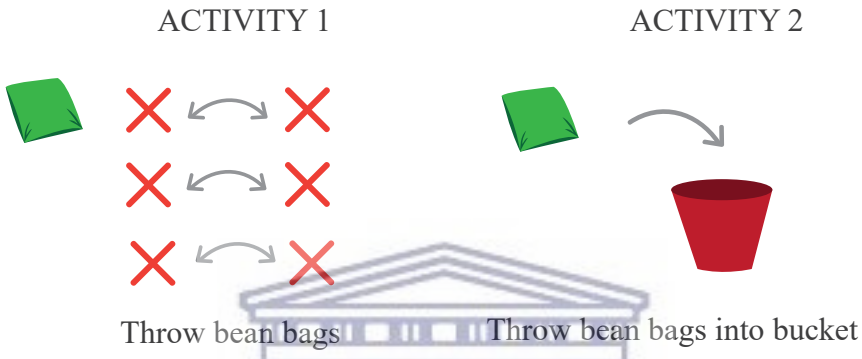
1

15min



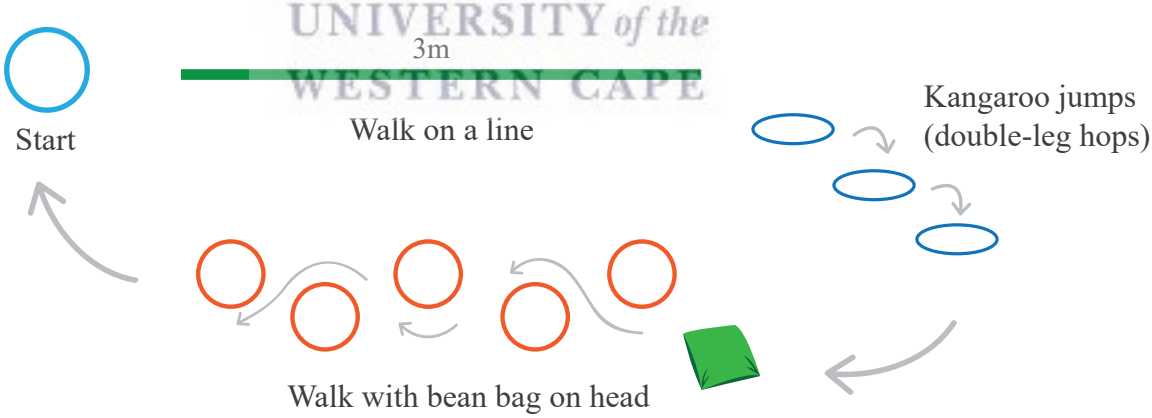
2

15min



3

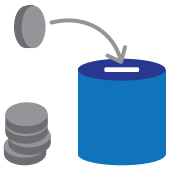
15min



1

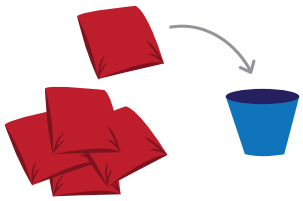
15min

ACTIVITY 1



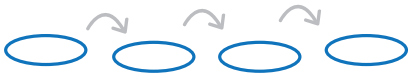
Money box
5 x left hand
5 x right hand

ACTIVITY 2



Throw 5 bean bags into bucket

ACTIVITY 3



Double-leg hops

2

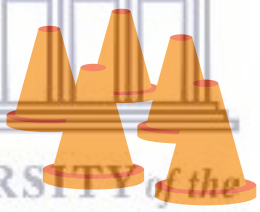
15min

Crawl through tunnel

Jump hoops

3m

Walk on a line



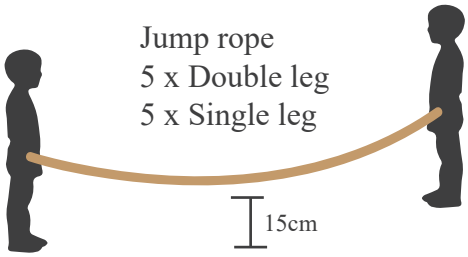
Crab walk to start

Collect cones and stack in pile

3

15min

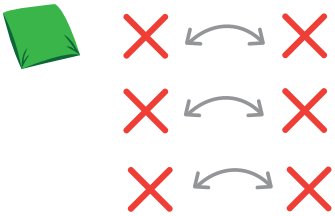
ACTIVITY 1



Jump rope
5 x Double leg
5 x Single leg

15cm

ACTIVITY 2



Throw bean bags

1

15min

ACTIVITY 1

Crumpling newspaper

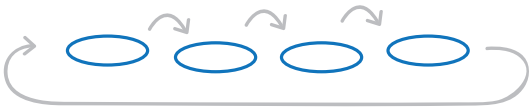
ACTIVITY 2

Stringing beads

2

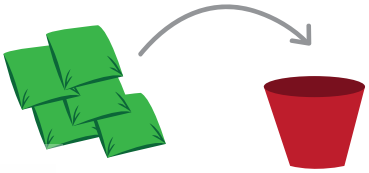
15min

ACTIVITY 1



Jump through hoops
- Single-leg hops
- Double-leg hops

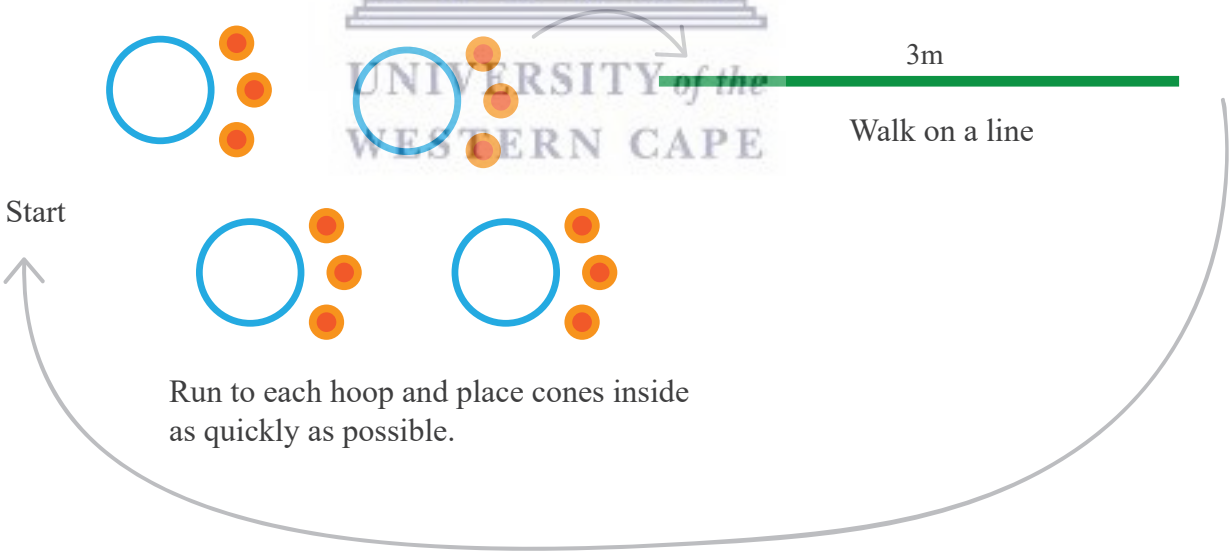
ACTIVITY 2



Throw 5 bean bags into bucket

3

15min



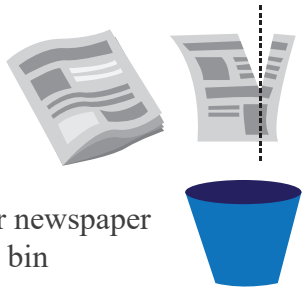
Walk on a line

Run to each hoop and place cones inside as quickly as possible.

1

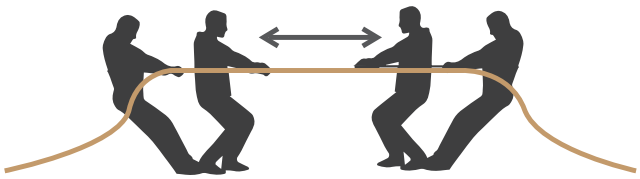
15min

ACTIVITY 1



Tear newspaper into bin

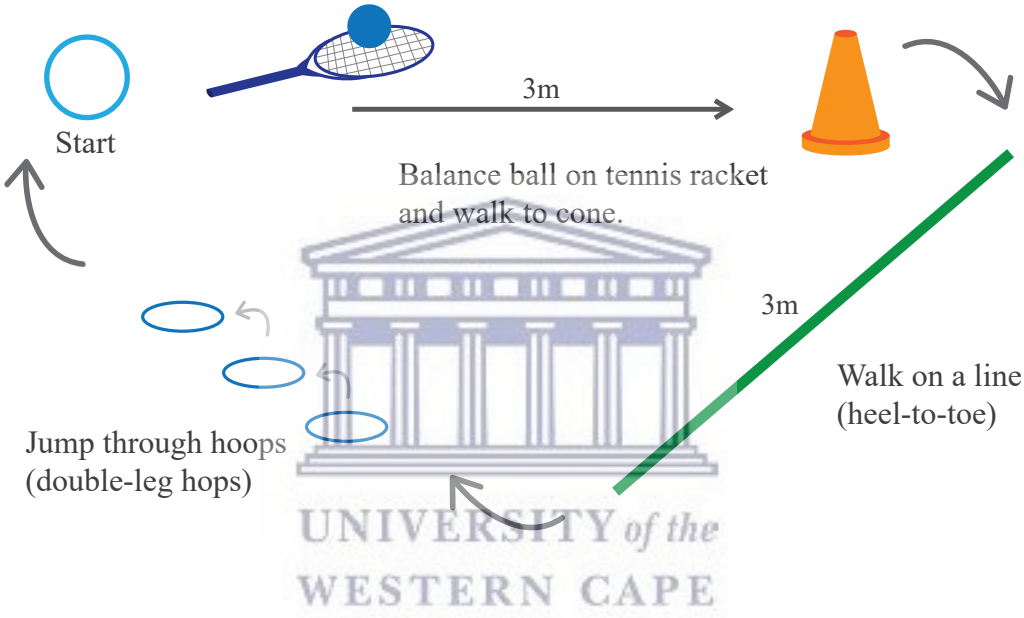
ACTIVITY 2



Tug of war

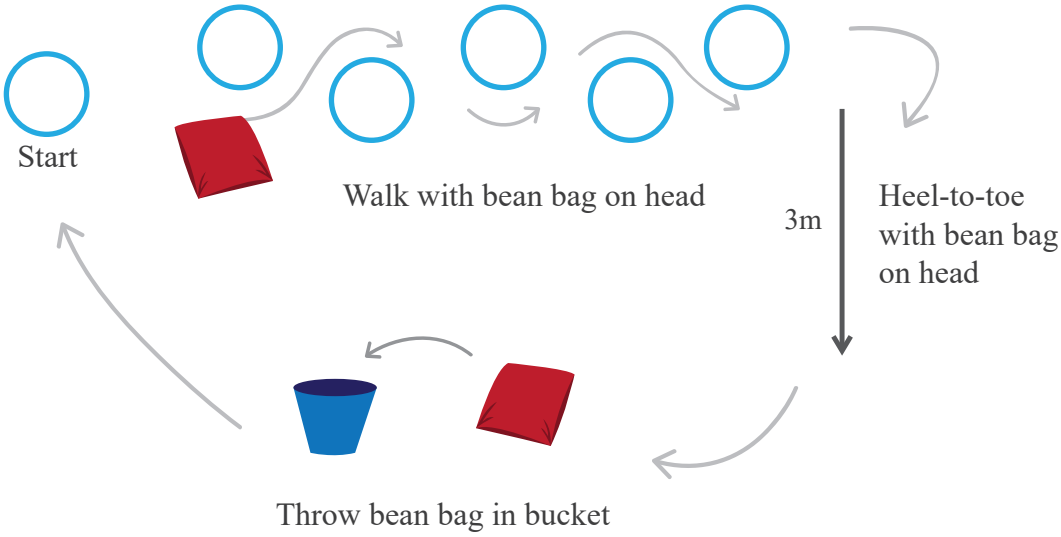
2

15min



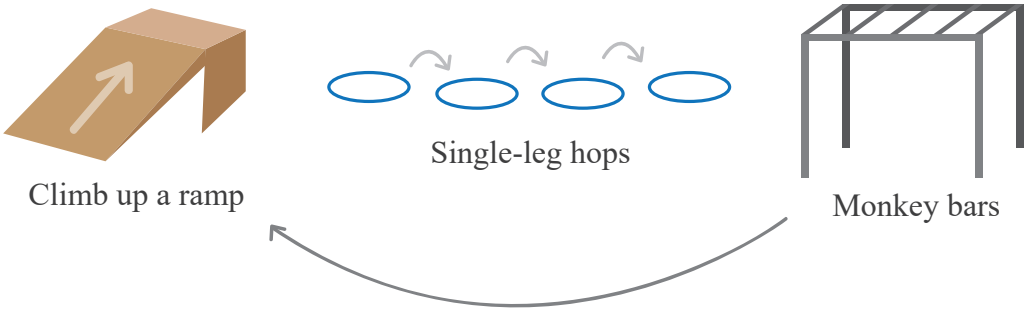
3

15min



1

15min

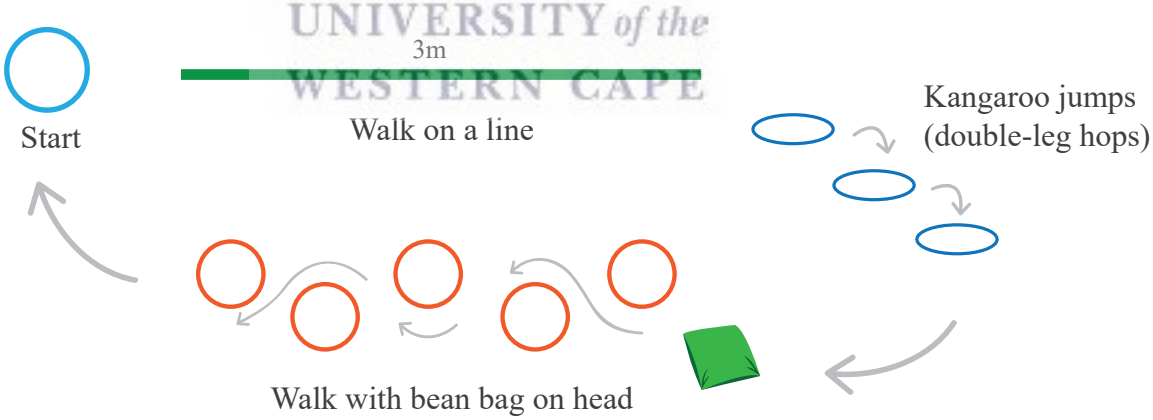


2

15min

3

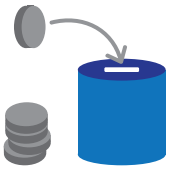
15min



1

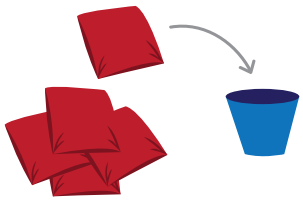
15min

ACTIVITY 1



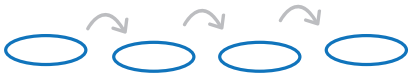
Money box
5 x left hand
5 x right hand

ACTIVITY 2



Throw 5 bean bags into bucket

ACTIVITY 3



Double-leg hops

2

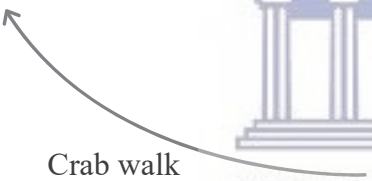
15min

Crawl through tunnel

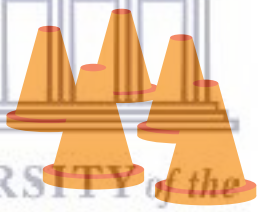
Jump hoops

3m

Walk on a line



Crab walk to start

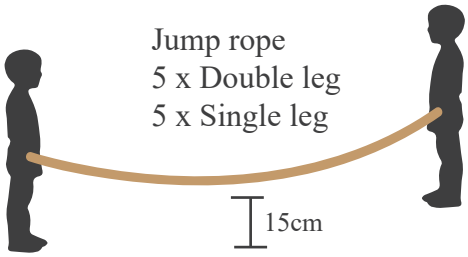


Collect cones and stack in pile

3

15min

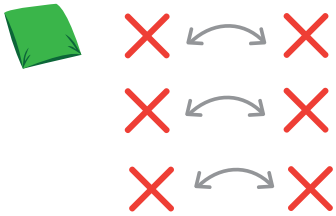
ACTIVITY 1



Jump rope
5 x Double leg
5 x Single leg

15cm

ACTIVITY 2



Throw bean bags

1

15min

ACTIVITY 1

Crumpling newspaper

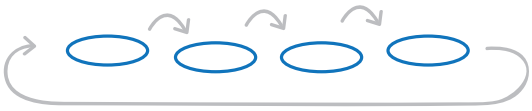
ACTIVITY 2

Stringing beads

2

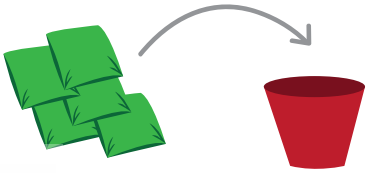
15min

ACTIVITY 1



Jump through hoops
- Single-leg hops
- Double-leg hops

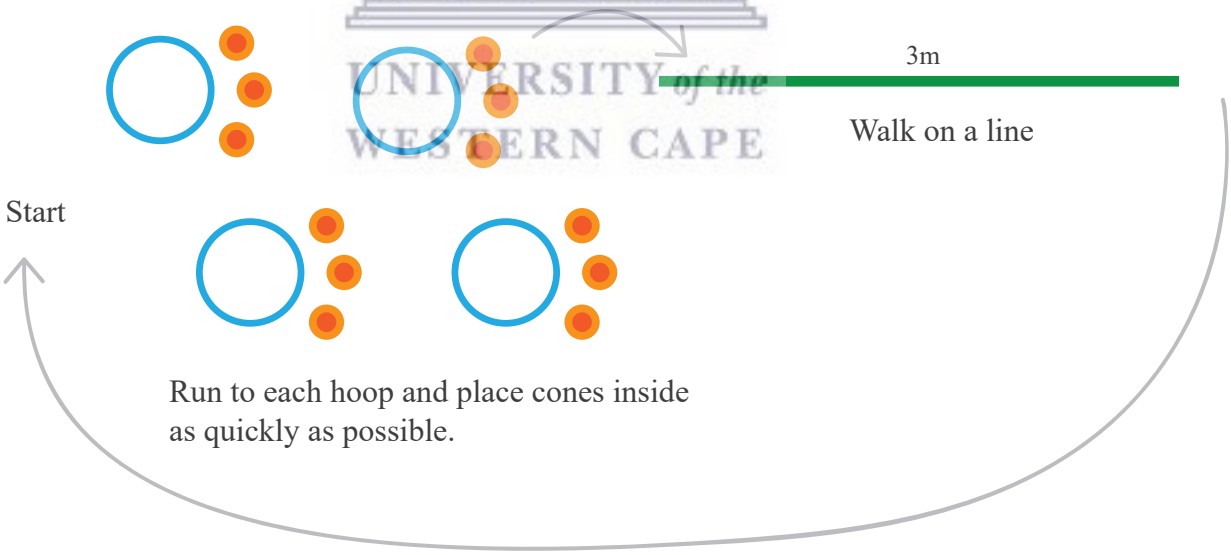
ACTIVITY 2



Throw 5 bean bags into bucket

3

15min



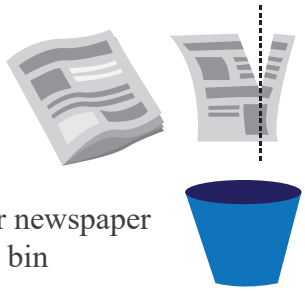
Walk on a line

Run to each hoop and place cones inside as quickly as possible.

1

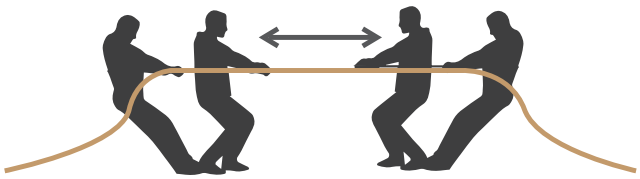
15min

ACTIVITY 1



Tear newspaper into bin

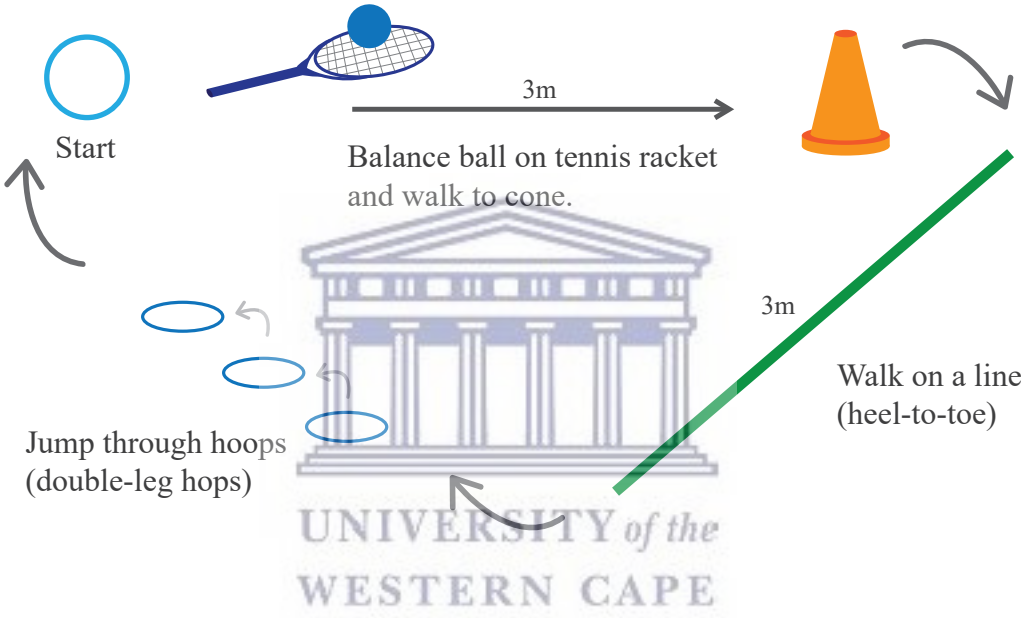
ACTIVITY 2



Tug of war

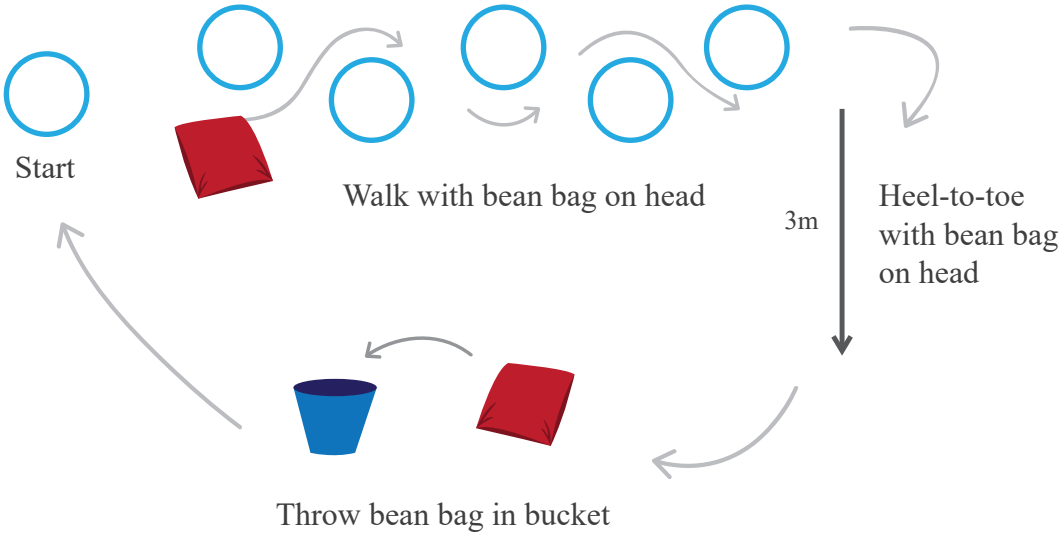
2

15min



3

15min



UNIVERSITY of the
WESTERN CAPE

OFFICE OF THE DEAN
DEPARTMENT OF RESEARCH DEVELOPMENT

APPENDIX C

31 October 2013

To Whom It May Concern

I hereby certify that the Senate Research Committee of the University of the Western Cape approved the methodology and ethics of the following research project by:
Mrs D Johnson (SRES)

Research Project:	The effect of a motor skills exercise programme on Quality of Life and motor skills development in profoundly deaf children aged six.
Registration no:	13/9/28

Any amendments, extension or other modifications to the protocol must be submitted to the Ethics Committee for approval.

The Committee must be informed of any serious adverse event and/or termination of the study.

Ms Patricia Josias
Research Ethics Committee Officer
University of the Western Cape

Private Bag X17, Bellville 7535, South Africa
T: +27 21 959 2988/2948 . F: +27 21 959 3170
E: pjosias@uwc.ac.za
www.uwc.ac.za

Western Cape Government
Education

Directorate: Research

Audrey.wyngaard2@pgwc.gov.za
tel: +27 021 467 9272
Fax: 0865902282
Private Bag x9114, Cape Town, 8000
wced.wcape.gov.za

REFERENCE: 20140204-24155 **APPENDIX D**
ENQUIRIES: Dr A T Wyngaard

Mrs Deidre Johnson
11 Zwaans Mews
Zwaans Road
Retreat
7945

Dear Mrs Deidre Johnson

RESEARCH PROPOSAL: THE EFFECT OF A MOTOR SKILLS EXERCISE PROGRAMME ON QUALITY OF LIFE AND MOTOR SKILLS DEVELOPMENT IN PROFOUNDLY DEAF CHILDREN AGED SIX

Your application to conduct the above-mentioned research in schools in the Western Cape has been approved subject to the following conditions:

1. Principals, educators and learners are under no obligation to assist you in your investigation.
2. Principals, educators, learners and schools should not be identifiable in any way from the results of the investigation.
3. You make all the arrangements concerning your investigation.
4. Educators' programmes are not to be interrupted.
5. The Study is to be conducted from **07 April 2014 till 30 September 2014**
6. No research can be conducted during the fourth term as schools are preparing and finalizing syllabi for examinations (October to December).
7. Should you wish to extend the period of your survey, please contact Dr A.T Wyngaard at the contact numbers above quoting the reference number?
8. A photocopy of this letter is submitted to the principal where the intended research is to be conducted.
9. Your research will be limited to the list of schools as forwarded to the Western Cape Education Department.
10. A brief summary of the content, findings and recommendations is provided to the Director: Research Services.
11. The Department receives a copy of the completed report/dissertation/thesis addressed to:

    The Director: Research Services
    Western Cape Education Department
    Private Bag X9114
    CAPE TOWN
    8000

We wish you success in your research.

Kind regards.
Signed: Dr Audrey T Wyngaard
Directorate: Research
DATE: 07 February 2014

APPENDIX E

UNIVERSITY OF THE WESTERN CAPE

Department of Sport, Recreation and Exercise Science
Private Bag X 17, Bellville 7535, South Africa
Tel: +27 21-959 2350 Fax: +27 21-959 3688
E-mail: ntsoli@uwc.ac.za

INFORMATION SHEET

Project Title: The effect of a motor skills exercise programme on quality of life and motor skills development in hard of hearing children in grade R to grade 2

What is this study about?

This is a research project being conducted by Deidre Johnson at the University of the Western Cape. We are inviting you to participate in this research project because you/your child may benefit in the overall objectives of this study. The purpose of this research project is to provide insight into the possible benefits of exercise on the motor control abilities of profoundly deaf children and to determine the learner's and parents/guardians perspectives of the influence of participation in physical activity on the child's quality of life (QOL). Furthermore, the objectives of this study will be to determine whether there is a change in motor abilities and QOL by using a movement assessment battery for children to assess fundamental motor abilities - these being balance (static and dynamic), ball skills and manual dexterity - and the TNO-AZL Preschool Children's Quality of Life questionnaire (TAPQOL) or the TNO-AZL Child Quality of Life questionnaire. These assessment tools will be utilised pre- and post-intervention.

What will I be asked to do if I agree to participate?

You will be asked to complete a Quality of Life questionnaire before and after the exercise intervention which you are allowing your child to participate in.

Your child will complete a motor ability assessment and will participate in an exercise intervention consisting of physical activities.

Would my participation in this study be kept confidential?

We will do our best to keep your personal information confidential. To help protect your confidentiality, all data and personal information will be kept in locked cabinets and/or in password locked personal computers and will not be accessed by anyone other than the researcher. Additionally, your name will not be included on the surveys and other collected data. If we write a report or article about this research project, your identity will be protected to the maximum extent possible.

In accordance with legal requirements and/or professional standards, we will disclose to the appropriate individuals and/or authorities information that comes to our attention concerning child abuse or neglect or potential harm to you or others.

What are the risks of this research?

As with any exercise activities, there may be some risks from participating in this research study. The subject may feel fatigued and slightly apprehensive when participating in some of the intervention activities. In addition, there is a risk of injury; however, every attempt will be made to have a safe exercise environment as well as a safe programme of activities being prescribed. I am a qualified Biokineticist with first aid training and will be available at all times should anything untoward occur. If this occurs, emergency procedures of the school will be followed immediately with referral to the appropriate medical personnel.

What are the benefits of this research?

This research is not designed to help you personally, but the results may help the investigator learn more about the effects of exercise/physical activity on the motor skills development and quality of life in children with hearing impairment. We hope that, in the future, other people might benefit from this study through improved understanding of the importance of improving motor skill ability and quality of life in children with hearing impairments through exercise and physical activity.

Do I have to be in this research and may I stop participating at any time?

Your participation in this research is voluntary. You may choose not to take part at all. If you decide to participate in this research, you may stop participating at any time. If you decide not to participate in this study or if you stop participating at any time, you will not be penalized or lose any benefits to which you otherwise may qualify.

Is any assistance available if I am negatively affected by participating in this study?
Should there be any negative impact on you (e.g. injury to your child), I will ensure their safety and first aid will be administered immediately, after which they will be referred to the appropriate medical specialist, counsellor etc.

What if I have questions?
This research is being conducted by Deidre Johnson in the Sports, Recreation and Exercise Science Department at the University of the Western Cape. If you have any questions about the research study itself, please contact Deidre Johnson on +27 82 724 7227 or email deidre.biokinetics@gmail.com

Should you have any questions regarding this study and your rights as a research participant or if you wish to report any problems you have experienced related to the study, please contact:

Study Supervisor: Prof. Susan Bassett
Tel: +27 21 959 2237
Email: sbassett@uwc.ac.za

OR Dean of the Faculty of Community and Health Sciences: Prof. José Frantz
University of the Western Cape
Private Bag X17
Bellville 7535
Tel: +27 21 959 2631
Email: jfrantz@uwc.ac.za

This research has been approved by the University of the Western Cape's Senate Research Committee and Ethics Committee.

APPENDIX F

UNIVERSITY OF THE WESTERN CAPE

Department of Sport, Recreation and Exercise Science
Private Bag X 17, Bellville 7535, South Africa
Tel: +27 21-959 2350 Fax: +27 21-959 3688
E-mail: ntsoli@uwc.ac.za

CONSENT FORM

Project Title: The effect of a motor skills exercise programme on quality of life and motor skills development in hard of hearing children in grade R to grade 2.

The study has been described to me in language that I understand, and I freely and voluntarily agree to participate. My questions about the study have been answered. I understand that my identity will not be disclosed and that I may withdraw from the study without giving a reason at any time and this will not negatively affect me in any way.

Participant's name……
Participant's signature……
Witness……
Date: ……

Should you have any questions regarding this study or wish to report any problems you have experienced related to the study, please contact the study coordinator:

Researcher: Deidre Johnson

Mobile number: 0827247227

Email address: deidre.biokinetics@gmail.com

Study Coordinator's Name: Prof. Susan Bassett

University of the Western Cape

Telephone: (021) 959 2273

Email: sbassett@uwc.ac.za

APPENDIX G

UNIVERSITY OF THE WESTERN CAPE

Department of Sport, Recreation and Exercise Science
Private Bag X 17, Bellville 7535, South Africa
Tel: +27 21-959 2350 Fax: +27 21-959 3688
E-mail: ntsoli@uwc.ac.za

ASSENT FORM

Project Title: The effect of a motor skills exercise programme on quality of life and motor skills development in hard of hearing children in Grade R to 2.

The study has been described to me so that I understand what I have to do, and I agree to join in this study. I am happy that any questions I asked have been answered. I understand that my name will not be used on any forms and that I may stop participating in the study any time I choose without giving a reason and that I will not be punished in any way for stopping.

Participant's name……

Participant's signature……

Witness……..

Date: …….

Should you have any more questions about this study or want to speak to someone else about any problems you have related to the study, please contact the researcher/study coordinator:

Researcher: Deidre Johnson
Mobile number: 0827247227
Email address: deidre.biokinetics@gmail.com
Study Coordinator's Name: Prof. Susan Bassett
University of the Western Cape
Telephone: (021) 959 2273
Email: sbassett@uwc.ac.za