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The point prevalence of paediatric upper limb fractures and their effect on the quality of life of children in rural Mpumalanga, South Africa

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The point prevalence of paediatric upper limb fractures and their effect on the quality of life of children in rural Mpumalanga, South Africa.

Panashe Furusa

1354488

A dissertation submitted to the Faculty of Health Sciences, University of the Witwatersrand, Johannesburg, in fulfilment of the requirements for the Master of Science in Physiotherapy.



Johannesburg, April 2025

DECLARATION

I, Panashe Marble Furusa, declare that the thesis, “The point prevalence of paediatric upper limb fractures and their effect on the quality of life of children in rural Mpumalanga, South Africa” is my original work, and is being submitted for the degree of Master of Science in Physiotherapy at the University of the Witwatersrand, Johannesburg. It has not been submitted for any degree or examination to any other university.



…… 25 April 2025 ……

Signature Date

DEDICATION

I dedicate this work to the Lord Almighty God.
“I can do all this through Him who gives me strength” – Philippians 4 verse 13 (NIV)

I also dedicate this to my daughter, Tadiwanashe Zoe Mukombachoto. May this always be a reminder that “with man this is impossible, but with God all things are possible” - Matthew 19 verse 26 (NIV)

ABSTRACT

Background: The incidence of upper limb fractures in the paediatric population is high. However, research investigating the point prevalence of ULFs and the effect of ULFs on HRQOL in children living in rural Mpumalanga, South Africa is limited.

Objectives: The objectives of this study were to A) Establish the baseline demographics of children with simple upper limb fractures in rural Mpumalanga, South Africa. B) Investigate the point prevalence of simple upper-limb fractures in children living in rural Mpumalanga, South Africa. C) Comparison of the body mass index of children sustaining simple upper limb fractures with statistical body mass index values of children according to the WHO. D) Investigate the health-related quality of life of children with simple upper limb fractures during the cast-immobilization stage of ULF recovery.

Methods: The method for Part A had hospital patient files reviewed between January 2019 and August 2023. Data was captured using RedCap and STATA (Stata Corp., USA). It focused on point prevalence of paediatric simple ULFs and baseline demographics. Part B participants meeting inclusion criteria were enrolled. Their height and weight were recorded, and the PedsQL was administered.

Results and Discussion: The results indicated the most injuries in the six to 12-year age group. Findings highlighted that the males had an increased risk of fractures. Supracondylar fractures are most common and due to falls that occurred in the home. Immobilization was the most common form of intervention. Hospital file discrepancies limited data retrieval. The PedsQL scores averaged low in all four sections. However, physical and emotional functioning had the lowest scores. Furthermore, it was identified that paediatric patients with ULFs generally did not receive physiotherapy rehabilitation to assess their physical functioning.

Conclusion: In this study, the demographics and point prevalence of ULFs was established. Findings identified a low HRQoL. This emphasises the need for early

physiotherapy intervention and referral pathways in children with ULFs presenting with low HRQOL in the physical functioning category.

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LIST OF ABBREVIATIONS

AUQUEI – Autoquestionnaire Qualité de vie Enfante Imagé (Child Self Questionnaire)
AMH - Amajuba Memorial Hospital
BH - Bethal Hospital
BMI – body mass index
BP – blood pressure
BSH – Bernice Samuel Hospital
CEO – Chief Executive Officer
CHQ - Child Health Questionnaire
COVID-19 - Coronavirus Disease
DoH - Declaration of Helsinki (DoH)
DOH – Department of Health
EH – Evander Hospital
ESIN - Elastic stable intramedullary nailing
FOOSH – falling on an outstretched hand.
HREC – Human Research Ethics Committee
HRQoL - Health Related Quality of Life
ICU – Intensive Care Unit
ICF – International Classification of Function
IQR - Interquartile Range
KINDL - Kinder Lebensqualitat fragebongen
MDT – multidisciplinary team
PedsQL - Paediatric Quality of Life Inventory
POP – plaster of Paris cast
PROMIS - Patient-Reported Outcomes Measurement Information System
OMs - outcome measures
QoL – quality of life
ROM – range of motion
SA – South Africa
SD – standard deviation
ULF – Upper Limb Fracture

VAS – visual analogue scale

WH – Witbank Hospital

WHO – World Health Organization

WMA - World Medical Association

CHAPTER 1: INTRODUCTION

1.1 Background

The incidence of fractures in the paediatric population is estimated to be equal to that in the elderly population. Upper limb fractures (ULF) account for 57% of fractures in children in South Africa (Safiejko et al., 2019). Maggio et al. (2018) reported that the most common long-bone fractures in the paediatric population occur in the forearm, accounting for 40% of all paediatric fractures. Fractures in healthy children and adolescents primarily occur because of trauma following a sporting activity, fall during play, or motor vehicle accidents (Stevens et al., 2012).

1.1.1 Fracture classification

A fracture is classified as a simple fracture when the skin overlying the fracture site is unbroken and the bone is unexposed to air (Thandrayen et al., 2008). Diaphyseal fractures are classified as simple fractures (type A), wedge fractures (type B), or multi-fragmentary fractures (type C).

Simple fractures are further classified as spiral fractures, oblique fractures (fracture line greater than or equal to 30 °to a line, and perpendicular to the long axis of the bone), or transverse fractures (fracture line less than 30 °to a line, and perpendicular to the long axis of the bone) (Thandrayen et al., 2008). End-segment fractures are classified as extra articular (type A), partial articular (type B), or complete articular (type C). Extra articular fractures are further classified as simple, avulsion or multi-fragmentary (Thandrayen et al., 2008). In this study, a particular focus was placed on simple fractures treated conservatively with cast immobilisation (Ceroni et al., 2011).

1.1.2 Immobilization

Cast immobilisation was used in the conservative management of fractures in all age groups by Thandrayen et al. (2008). Casts are applied for approximately four–12 weeks depending on the degree of fracture. Adequate callus formation is often the main criterion for cast removal. Callus formation is described as a bony deposit between and around the broken ends of bone fractures during normal healing (Thandrayen et al., 2008).

Cast immobilisation is often associated with a decrease in physical activity, substantial muscle atrophy, and bone tissue loss due to the size, weight, and length of the cast (Ceroni et al., 2011). Furthermore, decreased joint range of motion, muscle atrophy, and muscle shortening are common presentations after cast removal. Decreased physical activity is synonymous with sedentary and technologically enhanced activities, such as television watching and computer games (Ceroni et al., 2011).

However, children in rural South Africa are often not exposed to technological devices that mostly rely on active physical play as their main form of interaction (Liebs et al., 2021). Therefore, it is important to establish the effects of immobilisation on the health-related quality of life (Randsborg & Rotterud, 2016).

Additionally, rural communities have limited access to healthcare facilities with services that facilitate adequate rehabilitation during the immobilisation period. Children often develop fear of movement during this immobilisation period and avoid physical activity altogether, decreasing their level of physical activity (Liebs et al., 2021). Therefore, it is essential to investigate the overall effect of decreased physical activity following an upper limb fracture on health-related quality of life in children living in a rural South African setting.

1.1.3 Health-related quality of life

Health-related quality of life (HRQoL) is a multidimensional concept that includes domains related to physical, mental, emotional, and social functioning (Davis et al., 2006). Well-being is the central concept that assesses the positive aspects of life, emotions, and satisfaction (Davis et al., 2006). Additionally, the outcomes of decreased physical activity resulted in increased sedendary behaviours in children (Loprinzi & Cardinal, 2011). Therefore, the investigation of health-related quality of life is essential to understanding the well-being of the paediatric population following traumatic upper limb fracture and immobilisation in relation to physical activity limitations (Kenzik et al., 2015; Stevens, et al., 2012).

Active play significantly contributes to the holistic wellness of children compared to digital entertainment in the form of video games and television watching (Anderson,

2010). Play helps in the development of fine and gross motor skills. Active play allows the development of imagination, dexterity, and physical, cognitive, and emotional aspects of children (Anderson, 2010).

1.1.4 HRQoL Outcome Measure: Paediatric Quality of Life Inventory (PedsQL)

The Paediatric Quality of Life Inventory 4.0 Generic Core Scales (PedsQL) is an appropriate tool that can be used to measure the quality of life of children based on their health. This tool is a multidimensional self-report instrument that can be used with children and adolescents between five and 18 years (Pedsql.com, 2021). The questionnaire includes 23-items which encompass: physical functioning (eight items), emotional functioning (five items), social functioning (five items), and school functioning (five items). The instructions ask how much of a problem each item had been during the last month (Pedsql.com, 2021). It includes both self-report and parent proxy reports. The self-report format includes ages five–seven, eight–12, and 13–18 (Kenzik et al., 2015).

This outcome measure has been reported to represent an advancement in paediatric health related quality of life measurement as it combines reliability, validity, responsiveness, and practicality that is often rare in a single paediatric quality of life instrument (Kenzik et al., 2015)

1.2 Problem Statement

Very few South African studies have investigated the point prevalence of ULF and the effect of ULF on health-related quality of life in school-going children living in rural Mpumalanga, South Africa.

Children in rural Southern Africa predominantly engage in active physical play as their main form of interaction and play (Anderson, 2010). Therefore, the impact of decreased physical activity and play due to ULF on health-related quality of life is important (Liebs et al., 2021).

1.3 Research Question

The Research Question that this study aimed to address:

> What is the point prevalence of simple ULF and their effect on health-related quality of life in children living in rural Mpumalanga, South Africa?

1.4 Aims and Objectives

Aim of the Study

To investigate the point prevalence of simple ULF and establish the effects of ULF on the quality of life of children aged five–17 years living in rural Mpumalanga, South Africa.

Objectives of the Study

- To establish baseline demographics of children incurring simple upper limb fractures in rural Mpumalanga, South Africa.
- To investigate the point prevalence of simple upper limb fractures of children living in rural Mpumalanga, South Africa.
- To compare the body mass index of children sustaining simple upper limb fractures to children with statistical body mass index values of children according to WHO.
- To investigate the health-related quality of life of children with simple upper limb fractures during the cast-immobilization stage of upper limb fracture recovery.

1.4 Significance of the Study

Previous studies have outlined the effects of ULF on physical activity levels (Stevens et al., 2012). However, there are no known studies that investigate the effects on the overall quality of life of children living in rural Southern Africa following an upper limb fracture that has been conservatively managed and determine the impact on physical activity and physical functioning scores following upper limb fractures in the peadiatric population during and after the immobilization phase of the management. (Strydom et al., 2020). According to a study by Strydom et al (2020), there is limited studies that determine the epidemiology and point prevalence of children and adolescents admitted with orthopaedic injuries in developing countries. Hence there is a need for further research and literature.

Furthermore, this study will contribute to establishing baseline demographics of children incurring ULF and the point prevalence of ULF of children living in rural South Africa.

Additionally, this study will contribute to the scientific literature that investigates the effects on the overall quality of life of children living in rural South Africa following a conservatively managed upper limb fracture. Children often develop fear of movement during this immobilisation period and avoid physical activity altogether, decreasing their level of physical activity (Liebs et al., 2021).

This study aimed to establish the effects of simple ULF on health-related quality of life and investigate how simple ULF impact activities of daily life and play in children. The findings of the investigation on the impact of physical functioning would therefore determine whether early physiotherapy intervention could mitigate the effects and improve the overall health related quality of life in children with upper limb fractures (Bruder et al., 2011). Additionally, studies by Bruder et al. (2011) indicate that exercise in conjunction with other physiotherapy treatment modalities was one of the most common interventions used to reduce impairment and increase physical activity in the rehabilitation of people with upper limb fractures. Prescription of exercise after upper limb fracture was also consistent with the principle of fracture management and was found to be moderately-to-strongly associated with short- term outcomes of impairment and activity, particularly after distal radius fractures and humerus fractures. Physiotherapist prescribed exercises led to reduction in impairment, particularly range of movement in physical activity limitations. The findings of the study aimed to improve the referral pathways of physiotherapy interventions in children with simple ULF who presented with low physical functioning scores and would require physiotherapy intervention.

1.5 Outline of this dissertation

This dissertation is comprised of six chapters and appendices, see Figure 1.1. Chapter 1 provides the background and justification for this study. It also includes the aims, objectives, and research questions. Chapter 2 reviews the current literature related to this study. Chapter 3 outlines the methods used in this study. The results are presented in Chapter 4 and discussed in Chapter 5 where the limitations of the study

are further outlined. Finally, Chapter 6 concludes the thesis and provides recommendations for possible future studies.

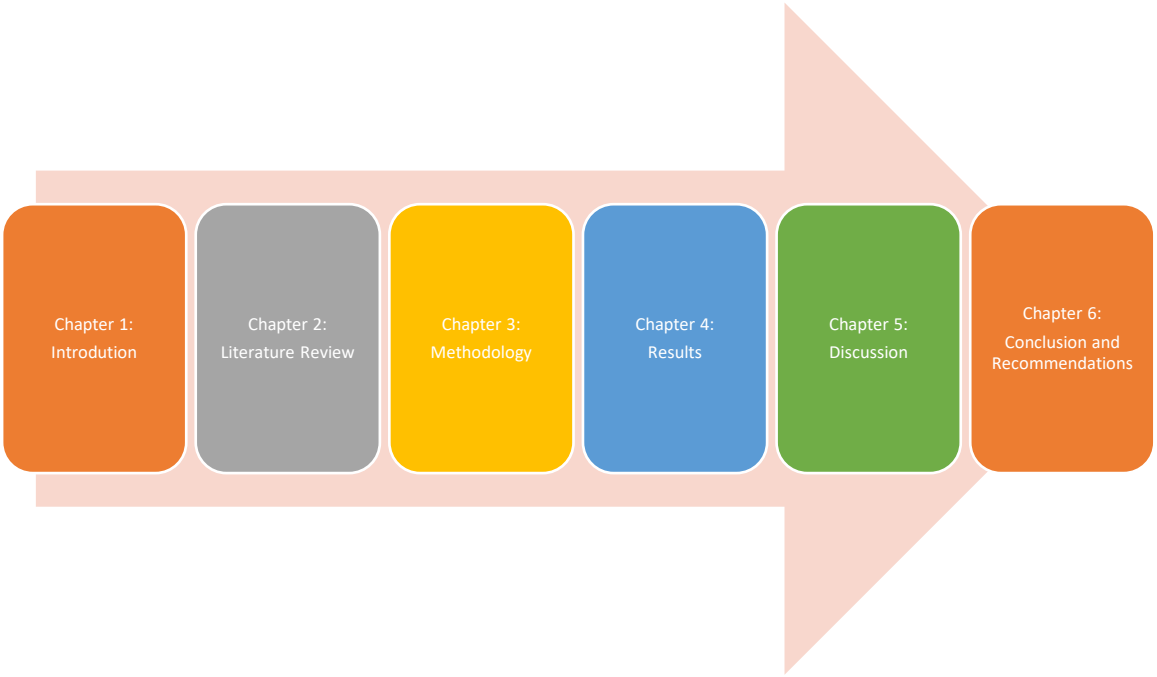

Figure 1.1: Thesis Summary

CHAPTER 2: LITERATURE REVIEW

2.1 Introduction

This literature review covers the point prevalence of paediatric upper limb fractures (ULF) and their effect on the quality of life of children aged five–17 years living in rural Mpumalanga, South Africa (SA). Additionally, health-related quality of life (HRQoL) outcome measures (OMs), with a focus on the PedsQL, will be reviewed.

Paediatric fractures are commonly treated in health facilities worldwide in high income and low-middle income countries. Globally, the incidence of paediatric fractures is estimated to be equal to that in the elderly population, with proximal humerus fractures being significantly more common in adolescents and children (Liebs et al., 2021).

Amongst the incidents of fractures in children in South Africa, upper limb fractures account for 57% of all traumatic fractures (Safiejko et al., 2019). According to Maggio et al. (2022), the most common long bone fractures in the paediatric population occur in the forearm region, accounting for 40% of all pediatric fractures. Sporting activity, fall during play, or motor vehicle accidents are the main causes of trauma cases in healthy children and adolescents (Stevens et al., 2012).

2.2 Search Strategy

A search strategy was developed to identify articles relevant to the following keywords: paediatric upper limb fractures (ULF), Paediatric Quality of Life Inventory (PedsQL), health-related quality of life in children, and physical activity levels in children. Data bases included PubMed, PEDRo, and Clinical Key with a criterion for literature written in English and less than 20 years old.

2.3 Epidemiology of upper limb fractures in South African children

According to Strydom et al. (2020), there is limited statistical data detailing the paediatric population numbers admitted with fractures in low-middle income countries, such as South Africa. Despite the wide range of international studies, Pasco et al. (2005), Gopinath et al. (2012), and Qui et al. (2022), these findings have minimal correlation with the South African context because of differences in economic and social circumstances. According to Strydom et al. (2020), the unique factors in South

Africa such as the socio-economic divide and a public health sector with limited resources due to increased trauma burden and a unique disease profile, hence a significant influence on the injury pattern and fracture management. South Africa faces a quadruple burden of disease, which includes; communicable diseases, non-communicable diseases, maternal and child mortality, and finally, injury and trauma (WHO., 2018).

Strydom et al. (2020) further indicated a higher male-to-female ratio for fracture admissions, with the highest admissions occurring in the five- six-year-old age group. The justification for this is that children at this age have a high level of mobility and increased curious behaviour; however, they have insufficient intellectual awareness of environmental hazards and poor safety compliance skills.

Similarly, Strydom et al. (2020) confirmed that falling to the ground is the most common mechanism of injury. According to this study, pedestrian vehicle accidents were the second most common (12.2%) cause of injury resulting in mandatory hospital admission, with most injuries in children aged 12 years or younger. Strydom et al. (2020) reported that the length of hospitalisation in paediatric limb fractures averages 8.6 days placing a high burden of care and a great strain on healthcare resources in low-middle income countries (Strydom et al., 2020). Furthermore, in low-income communities, the children's guardians often lack the financial resources required for regular hospital visits, and once discharged, a shortage of nursing staff coupled with high in-patient volumes limits the likelihood of home visits (Strydom et al., 2020)

According to Strydom et al. 2020 (28%) patients were excluded from the study due to incomplete records or missing files, indicating a decline in note keeping by the healthcare providers and limited accuracy in data capture by the relevant clerks. Furthermore, to establish the epidemiology of paediatric fractures, patients should be considered. However, due to unfortunate insufficiencies in the records, outpatient tracing proved difficult for participant inclusion in this research study. It was also established that there is no standard protocol on patient hospital admission; it is at the discretion of the on-duty doctor, resulting in discrepancies (Strydom et al., 2020)

2.4 Fracture Classification

A fracture is classified as a simple fracture when the overlying skin at the fracture site is intact and the bone is unexposed (Thandrayen et al., 2008). Diaphyseal fractures are classified as either simple fractures (type A), wedge fractures (type B), or complex multi-fragmentary fractures (type C).

Simple fractures are further classified as spiral, oblique (fracture line greater than or equal to 30 degrees to a line, and perpendicular to the long axis of the bone), or transverse (fracture line less than 30 degrees to a line, and perpendicular to the long axis of the bone) (Thandrayen et al., 2008). End-segment fractures are further classified as extra articular (type A), partial articular (type B), or complete articular (type C). Extra-articular fractures are further classified as simple, avulsion, or multi-fragmentary (Thandrayen et al., 2008). In this research study, a particular focus is placed on simple fractures that are predominantly treated conservatively with cast immobilisation (Ceroni et al., 2011).

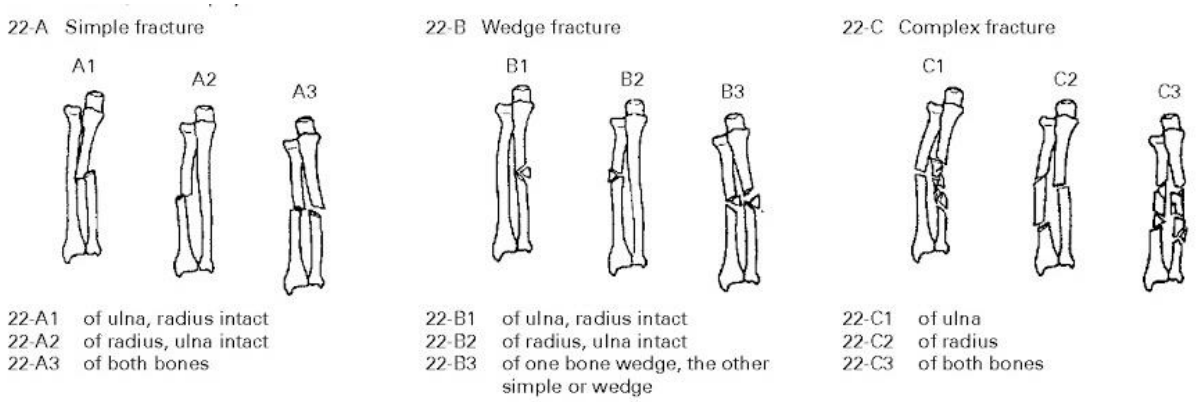

Figure 2.4.1: Classification of fractures (Goldfarb et al., 2005)

Additionally, the Salter-Harris classification is a system for categorization of paediatric physeal fractures that affects the growth plate. Type I is straight across, Type II is above, Type III is lower or below, Type IV is through, and Type V is erasure of the growth plate or crush (Cepela et al., 2016).

According to a study by Thandrayen et al. (2008), fracture rates in children in South Africa vary across different ethnic groups, with 22% of children in the population having reported fractures. According to this South African study, by the age of 16 years, 42%

of boys and 27% of girls had sustained an injury resulting in a fracture. The reasons for the increased fracture rate in boys have been attributed to their involvement in contact and high-impact outdoor play.

According to a study by Safiejko et al. (2019), the mean age of paediatric patients with limb injuries was equal for boys and girls (11.4 years and 11.3 years respectively). Upper limb injuries were predominantly forearm fractures (23%), wrist injuries (9.3%), and shoulder and upper arm injuries (9.3%). The primary mechanism of injury in children was identified as a fall (Strydom et al., 2020).

Furthermore, the main place of injury in the study group was identified as school, followed by a public place, and finally at home. Schools are often designed to not only provide children with physical education but also to encourage spontaneous play and engagement in physical activities, as schools are places where children spend a considerable amount of time (Safiejko et al., 2019). Therefore, this study indicates that physically active play is the main form of social interaction and development among school-going children.

2.5 Management

Bone healing in the paediatric population is often rapid and inversely proportional to the age of the patient. The presence of increased remodelling and increased callus formation decreases the point prevalence of prolonged complications in paediatric fractures. Conservative management in the majority of undisplaced upper-extremity fractures immobilization using a splint or cast, includes analgesic pain control, and facilitation of return of activity, provided that the fracture is not maligned (Arora et al., 2014). However, in displaced fractures, closed surgical reduction and immobilisation are both required, while open fractures require broad-spectrum antibiotics and tetanus vaccination (Arora et al., 2014).

2.5.1 Clavicle fractures

Clavicle fractures are the most commonly occurring fractures in paediatric patients. They occur in new-borns because of trauma during birth, whereas in adolescents and teenagers, they fall on an outstretched hand (FOOSH) or shoulder and from a direct impact (Arora et al., 2014).

Among infants, clavicular fractures are typically classified as greenstick fractures and are often unnoticed until the formation of a large callus. In the older paediatric population, the fracture is often displaced, and the symptoms include a lowered position of the affected shoulder, palpable tenderness, swelling, and visible deformity at the fracture site (Arora et al., 2014). Management includes the use of a sling for two - three weeks and pain control. The duration of healing is often six–18 weeks, accompanied by return to non-contact sports in four–six weeks, and return to physical contact sports when the child presents with no pain, full range of movements, and good strength (Arora et al., 2014).

2.5.2 Humerus fractures

Fractures of the proximal humerus are common in the paediatric population and peak during adolescence due to increased participation in sports, presenting as both physeal and metaphyseal fractures. A frequently occurring mechanism of injury is FOOSH or direct trauma to the proximal aspect of the humerus. This can be managed through immobilisation with a splint or arm sling for three–four weeks. When neurovascular damage, open or intra-articular fractures, or highly angulated fractures occur, surgical intervention is required (Arora et al., 2014).

According to the study by Hannonen et al. (2019), the majority of upper limb fractures to the proximal are treated conservatively with only 8% being treated operatiely with surgical fixation. In this study, paediatric patients with a fracture displacement more than a bone thickness (i.e., a bayonet displacement) were exclusively treated surgically (93.3%, N=14/15). While the patients with a displacement less than half of the bone thickness were very rarely surgically operated (1.3%, N = 2/151, P = 0.000). Furthermore, angular deformity >40° were associated with the increased likelihood of operative treatment (Hannonen et al., 2019)

2.5.3 Supracondylar fractures

Elbow fractures are common in the paediatric population and account for 10–12% of all paediatric fractures. Elbow fractures typically require precise surgical reduction (Cepela et al., 2016).

According to Arora et al., supracondylar fractures represent 60% to 80% of elbow fractures in the paediatric population, primarily occurring in the first ten years, and peaking between children five and seven years old (Arora et al., 2014). FOOSH injury with elbow hyperextension, such as a fall off monkey bars, is a highly common mechanism of injury. Clinical presentations include swelling and pain of the elbow and a limited range of motion (Arora et al., 2014).

Supracondylar fractures are classified based on the degree of displacement of the fractured distal fragment. According to the Gartland classification, Type I are non-displaced supracondylar fractures (Zorilla et al., 2015). Type II are fractures that present with slight displacement (>2mm) while the posterior cortex is intact (Zorilla et al., 2015). Type III fractures present with posterolateral displacement resulting in instability of the posterior cortex (Zorilla et al., 2015). Type IV are fractures with multidimensional instabilities.

Type I supracondylar fractures are managed through a long-arm cast for three–four weeks (Arora et al., 2014). Type II and Type III fractures are usually surgically treated with closed reduction and percutaneous pin fixation (Raux & Madelaine, 2023). Type IV fractures require complicated management using closed reduction and pinning with K wires (Zorilla et al., 2015). Unfortunately, supracondylar fractures have the highest number of complications among paediatric fractures, including neurovascular injuries, compartment syndrome, and Volkmann ischaemic contractures (Arora et al., 2014).

2.5.4 Lateral condyle

In the paediatric population, lateral condyle fractures result from FOOSH. The clinical presentation includes swelling and pain of the elbow, localised tenderness, and decreased range of movement. Management is often surgical (Arora et al., 2014). There is often a high incidence of malunion and non-union associated with this injury.

2.5.5 Medial epicondyle

Medial epicondyle is a common paediatric elbow fracture. It is usually observed in children between the ages of nine and 14 years. The common mechanism of injury is valgus stress, and most fractures involve dislocation of the elbow (Raux & Madelaine, 2023). Non-displaced fractures and stress fractures are often conservatively managed

in a posteriorly positioned splint or cast for three weeks (Arora et al., 2014). Displacement of greater than three millimetres to five millimetres or intra-articular loose bodies requires surgical intervention. The most common complications are decreased range of motion, ulnar nerve injury, and non-union (Arora et al., 2014).
Pediatric elbow fracture treatment shortcomings include stiffness, deformities, neurologic deficits, vascular injury, residual instability and radial head dislocation (Raux & Madelaine, 2023)

2.5.6 Radial fractures

Fractures of the radial neck and radial head are rare within the pediatric population (Dietzel et al., 2021). Children often incur fractures of the radial neck, whereas radial head fractures are primarily sustained by adults. Most fractures result from a FOOSH mechanism of injury, with the elbow in valgus and extension positions (Dietzel et al., 2021).

Undisplaced fractures or displaced fractures with angulation lower than 30-degree, are treated conservatively in a posteriorly positioned splint or cast. Fractures which are displaced or more often exhibit increased angulation and require surgical intervention. Surgical intervention was indicated when the proximal radius had complete displacement (Dietzel et al., 2021). When the radial neck indicated angulation above 45 degrees in children below 10 years old and above 20 degrees in children above 10 years old. Additionally, when an articular gap of above 2mm was seen in radial head fractures (Dietzel et al., 2021). Complications include increased joint stiffness, avascular necrosis of the radial head, decreased ROM, and posterior interosseous nerve injury (Arora et al., 2014).

2.5.7 Olecranon fractures

Isolated olecranon fractures are rare in children. These are often accompanied by other injuries to the elbow. The most frequent mechanism of injury is a fall directly onto the elbow or a direct trauma to the olecranon process. Objective assessment often indicates tenderness and swelling of the olecranon process and decreased elbow extension (Arora et al., 2014). If non-displaced, olecranon fractures can be treated in a cast; however, surgical management is essential for displaced fractures.

2.5.8 Forearm fractures

Paediatric fractures of the forearm account for half of all fractures in the paediatric population. They may appear in the proximal or central aspect of the forearm, but they are commonly distal to the bone. Bones in children are softer and more pliable than adults (Caruso., 2020). These properties result in different type of fractures: the buckle (torus) fracture is characterized by a compression with no disruption of the cortex. The Greenstick fractures characterized by an intact cortical and the other cortex is disrupted on the tension side. The complete fracture is characterized by the involvement of both cortical. The Salter and Harris classification is used if the fractures involve the growth plate (Caruso et al., 2020)

In children younger than ten years of age, buckle and greenstick fractures occur most frequently, whereas growth plate and complete fractures are more likely in patients older than ten years of age and adolescents, respectively (Arora et al., 2014). Fracture dislocations of the forearm also occur, with shortening of one of the two bones and dislocation of the other.

Monteggia fractures are classified as dislocation of the radial head, proximal ulnar fracture, or deformity of the ulna without an overt fracture. Galeazzi fractures are fewer common injuries, classified as fractures of the distal radial shaft with an additional disruption of the distal radioulnar joint. Additionally, fractures of the forearm typically result from FOOSH injury or direct impact. The type of fracture and degree of displacement determine intervention (Arora et al., 2014).

Buckle fractures are treated with a cast or splint for two–three weeks until they heal. Closed reduction and immobilization for six–12 weeks in a long-arm cast is necessary for greenstick fracture angulation above ten degrees. The remodelling phase has immense potential and often yields positive outcomes. Surgical intervention is necessary in the presence of Salter-Harris types III and IV fractures of the distal radial physis, open fractures, failed or unstable reductions, and vascular injuries (Arora et al., 2014).

2.5.9 Scaphoid fractures

The mechanisms of injury that produce bony wrist injuries in adults often result in fractures of the forearm in children, as carpal bones are predominately cartilaginous in children. Acute wrist injuries primarily occur due to FOOSH or direct blunt trauma. The scaphoid bone is the most fractured carpal bone, and suspected scaphoid injuries can be treated with a splint (Arora et al., 2014).

The treatment and prognosis of the injury depend on the fracture site. Distal and middle one-third scaphoid fractures are commonly non-displaced and are managed with a short arm thumb spica cast for four–eight weeks (Arora et al., 2014). Proximal and displaced scaphoid fractures commonly require surgical intervention as they have increased blood supply, thus increasing the risk of non-union.

2.5.10 Metacarpal fractures

Metacarpal fractures are the second most common type of upper-limb fractures. They mostly occur due to a direct blow or trauma to a closed hand. The neck of the fifth metacarpal is the most common injury site (Arora et al., 2014). The phalanges are frequently fractured, and the distal phalanx is the most affected area.

2.5.11 Distal phalanx fractures

The most common mechanism of injury is crush or axial load injury of the distal phalanx, often associated with nail bed or fingertip injury. Paediatric hand injuries are usually managed non-operatively through immobilisation in a radial or ulnar gutter splint. Most phalange fractures can be treated with buddy taping or splinting for three–four weeks (Arora et al., 2014). Antibiotic medications are often prescribed when associated with nail trauma, as they are classified as open fractures.

ULF commonly occur in paediatric patients (Arora et al., 2014). Therefore, it is essential for healthcare professionals to be aware of the unique differences and patterns of fractures in children, as this influences patient management and recovery outcomes.

2.6 Conservative Cast Immobilization

Paediatric fractures are carefully considered prior to treatment based on displacement and angulation, as well as on the patient's age and remaining growth from the proximal physis. (Liebs et al., 2021). Numerous orthopaedic surgical interventions have been described for these injuries, such as internal fixation with Kirschner (K) wires, open reduction, plates, screws, or a palm tree technique. Furthermore, elastic stable intramedullary nailing (ESIN) has become a common intervention (Liebs et al., 2021).

2.6.1 Cast Immobilization

Current literature supports management with cast immobilization maintained for 6–8 weeks, until the health care professional finds a complete healing of the fracture with good bone union. Older children may require 8 to 10 weeks of immobilization.
In most cases, the children can resume activities 4–6 weeks after cast removal.
(Caruso et al., 2020)

The analysis of available data in the literature shows that conservative management is a very common, safe and successful treatment option in pediatric forearm fractures. Current literature agrees about conservative treatment as a gold standard between defined parameters. Exceeded these parameters; the surgical treatment is indicated, with special regard to patients age, fracture pattern and the surgeon experience. In the event that an acceptable reduction cannot be obtained with closed reduction and casting, operative intervention is recommended. The indications for surgery are unstable and irreducible fractures and, refracture at a site of previous fracture, open fractures, fractures with neurovascular compromise, pathologic fractures and forearm fractures with associated humerus fracture. (Caruso et al., 2020)

Complications of cast immobilization included loss of bone mass, muscle atrophy, functional limitations, and joint stiffness, which are more severe for adolescent. Stiffness in the elbow and/or wrist is frequent after coming out of the cast. This usually gets better on its own after a few weeks, but in occasional cases, physical therapy is needed to help regain motion. (Caruso et al., 2020)

Furthermore, cast immobilisation was used for the conservative management of fractures in all age groups. Casts are applied for four–12 weeks depending on the degree of the fracture, which often results in a longer duration for recovery of range of motion and muscle strength (Jha et al., 2018). Adequate callus formation is often the main criterion for cast removal. Callus formation is described as a bony deposit between and around the broken ends of bone fractures during normal healing (Thandrayen et al., 2008).

Cast immobilisation is often associated with a decrease in physical activity, substantial muscle atrophy, and bone tissue loss due to the size, weight, and length of the cast (Ceroni et al., 2011). Muscle atrophy is also a common result of immobilization as there is often a decrease in the muscle volume (Psatha et al. 2013) Furthermore, decreased joint range of motion and muscle shortening are common presentations after cast removal (Psatha et al. 2013). Decreased physical activity is synonymous with sedentary and technologically enhanced activities, such as television watching and computer games (Ceroni et al., 2011).

According to a study by Rutarama et al (2019), the study demonstrated that most children with upper limb fractures, particularly Gartland Type III supracondylar fractures gained full elbow range of motion and had good functional outcome by 24 weeks after closed reduction and percutaneous cross K wires. Further findings demonstrated that children who were older than 7 years of age and those that sustained severe soft tissue injuries (open fractures, nerve injuries, compartment syndrome or internal degloving injuries) did not always present with excellent clinical outcomes, yet and the value of a physiotherapy rehabilitation programme for patients identified to be at risk of poor outcome (those over 7 years of age or with associated soft tissue injuries) required further prospective study.

However, according to a study by Gimigliano et al (2022), the study indicated that based on the fracture severity, related treatment (more invasive), and immobilization, these factors may result in slower range of motion restoration. Additionally, there were indications of low bone mineral mass after cast immobilization following upper limb fractures (Gimigliano et al., 2022).

Additionally, possible complications of supracondylar humerus fractures might be injuries of the brachial artery and radial or median nerves that would require prompt investigation and appropriate rehabilitation intervention (Gimigliano et al., 2022). Although joint stiffness is rarely reported in pediatric patients compared with adults, therefore making routine physiotherapy unnecessary, it is essential that a patient centred approach is implemented to quickly identify the possible rehabilitation needs of the pediatric population following a fracture presenting with complications (Gimigliano et al., 2022).

According to Jha et al (2018), children in low-income community backgrounds are more likely to be expected to participate in daily household activities from early periods, as compared to children in high income community backgrounds, this results in increased frustration with immobilization limitations (Jha et al., 2018)

Additionally, rural communities have limited access to healthcare facilities with services that facilitate adequate rehabilitation during the immobilisation period. Children often develop fear of movement during this immobilisation period and avoid physical activity altogether, decreasing their level of physical activity (Liebs et al., 2021). A study by Colaris et al (2013) evaluated severe limitation of pronation and supination range of motion using three-dimensional imaging in children who sustained a both-bone forearm fracture. The findings revealed that mal-alignment of the forearm and the severe limitation of pronation/supination made it difficult for children to place the volar aspect of the elbow flat on the table, which is a common posture in the classroom and at the dinner table (Colaris et al., 2013). As a result, this further indicates the necessity to investigate the health-related quality of life and potentially early physiotherapy rehabilitation interventions for high-risk patients and those displaying limitation in range of motion resulting in low physical functioning scores (Colaris et al., 2013).

Therefore, it is essential to investigate the overall effect of decreased physical activity following an upper limb fracture on health-related quality of life in children living in a rural South African setting.

2.7 Socioeconomic status

According to a study by Ugochi et al. (2018) socioeconomic status influences both the point prevalence and treatment outcomes of musculoskeletal conditions (Ugochi et al., 2018). Increased social deprivation has been associated with an increased risk of hand and upper-limb fractures. The primary aim of this study was to evaluate the association between social deprivation and health-related quality-of-life outcome measures in paediatric patients with ULF.

According to the results of the study data, it was apparent that children in the most socially deprived classification had poorer scores in the Upper Extremity Function, Mobility, Pain Interference, and Peer Relationship domains than children in the least socially deprived classification, when comparing those individuals from low family socioeconomic levels with those from high socioeconomic levels (Davis et al., 2006). It is evident that the low socioeconomic group reported more pain, worse Childhood Health Assessment Questionnaire scores, and worse expectations regarding their chances for improvement with treatment. The results of the study advocate the increased involvement of multidisciplinary teams to provide holistic educational, psychological, and social resources to this group.

Furthermore, Ugochi et al. (20218) also established that children with increased social deprivation start with lower baseline perceived health and, despite the same improvement from treatment, often present with worse Patient-Reported Outcomes Measurement Information System (PROMIS) scores than patients with good socioeconomic backgrounds.

2.8 Health Related Quality of Life

Health related quality of life (HRQoL) has been defined, as “functioning, feelings about functioning, health and value assigned to duration of life”, according to Davis, et al., 2006. The literature suggests that upper-limb fractures may influence the quality of life of children. This effect can be measured by various methods (Davis et al., 2006). Quality of life can be quantified using most outcome measures, in the form of questionnaires or self-report instruments. Some of these instruments are generic and can be used universally, whereas others have been developed for specific conditions (Ugochi et al., 2018).

Health-related quality of life (HRQOL) is a patient-assessed outcome that reflects and assesses a patient's view of their health experience. Health-related quality of life (HRQoL) is a multidimensional concept that includes domains related to physical, mental, emotional, and social functioning (Davis et al., 2006). Well-being is the central concept that assesses the positive aspects of life, emotions, and satisfaction (Davis et al., 2006). Therefore, the investigation of health-related quality of life is essential to understanding the well-being of the paediatric population following traumatic upper limb fracture and immobilisation in relation to physical activity limitations (Stevens et al., 2012; Kenzik et al., 2015).

2.9 Health-related quality of life Outcome Measures

An example of this is the self-report version of the Child Health Questionnaire (CHQ), which measures the functional health and well-being of children between the ages of five and 18 years (Williams et al., 2005). This outcome measure includes both a short and longer version of the parent/proxy-report as well as a self-report for the ages 10-18 years (Williams et al., 2005).

Another commonly used outcome is the Kinder Lebensqualitat fragebongen (KINDL) which is a generic instrument for assessing Health-Related Quality of Life in children and adolescents aged three–17 years. It considers QoL a psychological construct that includes physical, psychological, and functional aspects of well-being and daily functioning (Ugochi et al., 2018). The tool has 24 questions and three versions for different ages and stages of development and is available in paper-pencil and computer versions.

Additionally, AUQUEI is a pictured child's QoL self-questionnaire that assesses the child's subjective QoL (Ugochi et al., 2018). It comprises 26 items for children aged three–five and 33 for children between the ages of six and 11 years. The questionnaire covered the following dimensions: family life and relationships, external activities, leisure activities, separation situations, major functions, social relations, and treatment situations. This tool has been reported to be heavily subjective, as it makes use of images, thus proving to be a limitation (Ugochi et al., 2018).

Additionally, the Paediatric Quality of Life Inventory 4.0 Generic Core Scales (PedsQL) is an appropriate tool that can be used to measure the quality of life of children based on their health (Kenzik et al., 2015). The PedsQL takes approximately five–to-ten minutes to complete and has been validated for use in various capacities, including in-person interviews, self-administration, and telephonic completion. This tool is a multidimensional self-report instrument that can be used with children and adolescents between five and 18 years (Pedsql.com, 2021). The questionnaire includes 23-items which encompass: physical functioning (eight items), emotional functioning (five items), social functioning (five items), and school functioning (five items).

Furthermore, study on health-related quality of life in children with traumatic minor injuries showed strong reliability, reflected by the high values for the total scale and most subscales using the PedsQL (Stevens et al., 2012). The PedsQL was found to be feasible and reliable to have good construct validity to discriminate the patient outcome severity levels and responsive to changes in health status (Stevens et al., 2012).

2.10 Impact of upper limb fractures on Health-Related Quality of Life

In a prospective cohort study by Stevens et al. (2012), children aged two to 17 were assessed. Of the 334 participants, 82 presented with fractures, 191 with soft tissue injuries, 37 with muscle strains and 24 with head injuries. PedsQL scores reflected decreased HRQOL in groups with increasing severity of clinical symptoms, as well as significant negative changes in participants with decreased functional outcomes, including those with upper limb fractures (Stevens et al., 2012).

According to a study by Ratajczak et al. (2022), there is evidence of decreased health-related quality of life score recorded for injury to the dominant upper limb than to the non-dominant upper limb. Moreover, it is shown that injury to the dominant upper limb can negatively impact the overall assessment of the quality of life in participants compared to participants with non-dominant upper limb injuries (Ratajczak et al., 2022)

Furthermore, in a study by Ceroni et al. (2011) investigating physical activity in adolescents with limb fractures, participants with ULF were considerably less physically active, with a 30.10% decrease in comparison to the healthy fracture-free

control participants. In the healthy control participant group, the average time spent in moderate-to-vigorous intensity activity was 59.40 minutes to 66.70 minutes daily. However, the average time spent by adolescents with ULF was 42.10 minutes (Bruder et al., 2012). International guidelines suggest that school-going aged children are expected to participate daily in at least 60 minutes of moderate-to-vigorous intensity activity to prevent weight gain, premature development of cardiovascular diseases and type 2 diabetes, and increase bone mineral mass (Strydom et al., 2020).

Additionally, a study suggested that the decrease in physical activity levels in adolescents with ULF during the immobilisation period may be the starting point of weight gain and bone mineral loss in children and adolescents. Therefore, this study indicates the decrease of physical activity due to the cast immobilization period results in sedentary behaviour. (Gopinath et al., 2012).

2.11 Benefits of Physical Activity in Play

According to Anderson et al. (2010), there are a multitude of benefits to physical playing for children that are important in healthy brain development; they gain most of their knowledge and ability to think, remember, and solve problems through play. Children develop problem-solving skills through games, make-belief, and puzzles (Ma & Jones, 2003). Children involved in make-believe play can engage in several types of learning. Active play allows children to improve their communication and vocabulary by imitating other children and adults. Anderson et al. (2010) was of the view that a simple game such as playing “house” helps children to be creative and imitate their family experiences. Hence, this helps children learn about relationships in the family and roles in society, improving their understanding of the world.

Additionally, participation in active play helps promote self-discovery, self-confidence, and self-resilience in children. This is supported by Anderson et al. (2010), who stated that active play helps an individual child learn team player skills facilitated by negotiation, problem solving, and sharing (Strydom et al., 2020).

Active play facilitates healthy physical movements and improves physical health. According to a study by Stevens et al (2023), participation in playground play

increased the heart rate of children aged between 4 years old to 11 years old. Participation in playground play stimulated 77% of the time at moderate and vigorous heart rate and 19.2% at peak heart rate values (Stevens et al., 2023) This in turn increased physical activity improved cardiovascular function (Stevens et al., 2023). Physically active play is important when children enter school. Physically active play assists children in adjusting to their school settings. Ma & Jones (2003) found that playtime in school, such as break time or after-care, facilitates the learning of basic social skills, while exploratory play allows children time to discover and manipulate their surroundings (Ma & Jones, 2003; Bruder et al., 2012). This is supported by the findings of Anderson et al (2010) that showed, active play is how children learn to socialise, think, solve problems, mature, and most importantly, have fun. Active play therefore connects children with their imagination, environment, parents and family, and the world (Anderson et al., 2010).

Therefore, it is clear that play allows the development of fine and gross motor skills. Play also stimulates language development, socialisation skills, communication of emotions, problem-solving, and creativity.

According to research findings by Becheva et al (2023), physical activity at an early age helps to strengthen and toughen the body and increase its resistance to diseases. Children develop physical qualities and the capacity to act, form skills and build motivation for independent motor activity, complex development of motor skills, and the coordination of movement (Becheva et al., 2023)

Motor coordination provided an opportunity to perform many motor actions in everyday life, in work and sports accurately. In preschool age, through sports activities, adolescents form motor skills and habits, develop physical qualities and improve coordination abilities (Becheva et al., 2023). Participation in physical activity for children resulted in improving physical and mental health, endurance, concentration, as well as the quality of sleep (Becheva et al., 2023). The psychosocial impact of physical activity participation resulted in developing valuable personal qualities: courage, initiative, resourcefulness, self-control, independence, self-confidence, and adaptability (Becheva et al., 2023).

2.12 Effect on Active Play

Active play significantly contributes to the holistic wellness of children compared to digital entertainment in the form of video games and television watching (Anderson-McNamee, 2010). Active play allows the development of imagination, dexterity, and physical, cognitive, and emotional aspects of children (Anderson-McNamee, 2010).
In the 21st century, technological developments have exposed children to technologies, such as cellular phones, tablets, computers, and videos. Children who spend most of their time using technology often have decreased physical activity (Anderson-McNamee, 2010).

Gopinath et al. (2012) found that adolescent individuals who participate in physically active play have higher scores on health-related quality of life compared to adolescents with lower participation. Conversely, adolescents who participated in high levels of technological on-screen consumption reported significantly lower PedsQL assessment scores in multiple domains. This indicates a strong association between regular physically active play and a high health-related quality of life during adolescence (Gopinath et al., 2012).

Furthermore, the link between high participation levels in active physical play and high health-related quality of life was identified in the physical and social dimensions of the PedsQL. Adolescents reported minimal limitations in physical activities of daily living, such as walking a distance and lifting objects. Additionally, scores showing increased social functioning in physically active adolescents are likely linked to the development of social reinforcement and social interaction during participation in physically active play (Anderson-McNamee, 2010)

Adolescents with increased involvement in physically active play had indications of decreased loneliness and shy feelings, while adolescents with decreased physically active play had decreased scores in the social domain. There is a direct proportional relationship between physical activity in adolescents and their psychosocial health and emotional well-being. Increased screen-time entertainment has been associated with lower scores in multiple PedsQL domains among adolescents, and studies have also shown that frequent screen time is linked to health-related quality of life deficits, such as reduced psychological well-being, decreased physical health, poor self-esteem,

decreased life satisfaction, and low cognitive performance. The sedentary nature of many screen-viewing activities underlies with these negative health indicators, particularly since time spent passively watching television does not involve active engaging in social interactions or challenging one's cognitive and physical capacities (Gopinath et al., 2012).

Therefore, it has been established that regular involvement in outdoor active play in the long-term was synonymous with improved health-related quality of life in adolescents. Conversely, increased levels of technological on-screen entertainment are associated with a low health-related quality of life (Ratajczak et al., 2022).

Furthermore, in rural communities with a lack of technological exposure, children in rural Southern Africa predominantly engage in active physical play as their main form of interaction and play (Anderson-McNamee, 2010). Therefore, the impact of decreased physical activity and play due to ULF on health-related quality of life is important (Liebs et al., 2021).

2.13 Conclusion

Previous studies have outlined the effects of ULF on physical activity levels (Stevens et al., 2012). However, there are no known studies that investigate the effects on the overall quality of life of children living in rural Southern Africa following an upper limb fracture that has been conservatively managed.

Furthermore, this research study will contribute to establishing baseline demographics of children incurring ULF and the point prevalence of ULF of children living in rural South Africa (Gashaw & Yitayal, 2020).

Additionally, this study will contribute to the scientific literature that investigates the effects on the overall quality of life of children living in rural South Africa following a conservatively managed upper limb fracture. Children often develop fear of movement during this immobilisation period and avoid physical activity altogether, decreasing their level of physical activity (Liebs et al., 2021).

This study aimed to establish the effects of simple ULF on health-related quality of life and investigate how simple ULF impact activities of daily life and play in children to

advocate for early physiotherapy intervention for children with low physical functioning scores. Additionally, the findings of the study aimed to improve the referral pathways of physiotherapy interventions in children with simple ULF.

In conclusion, the literature indicates that health-related quality of life, particularly physical activity, and social participation scores, is lower in children with ULF than in unaffected children. This suggests that children and adolescents with upper-limb fractures are likely to have decreased engagement in active physical play.
Additionally, the literature highlighted that overall, health-related quality of life levels for social participation were statistically lower for children with ULF. This suggests that children and adolescents with upper-limb fractures are likely to have decreased engagement in social settings, which is affected by stigma and personal fear. Therefore, it is necessary for children to receive counselling programmes and social inclusion support in addition to their medical management.

Furthermore, a variety of outcome measures and instruments have been investigated for their effectiveness and appropriateness in assessing the effect of paediatric ULF on the quality of life of children. Strengths and weaknesses were identified in each outcome measure. Most items were ranked highly in terms of reliability and validity.

Overall, the analysis of the literature regarding the point prevalence and effects of ULF in children and the effectiveness of the tool used indicate a clear difference in the overall health and well-being of children with ULF.

CHAPTER 3: METHODOLOGY

3.1 Introduction

This chapter provides a full description of the methodology used in this study. The study was divided into two parts:

Part A – Retrospective record review, and

Part B – Cross-sectional study investigating the quality of life of children who sustained upper limb fractures.

The study setting for the study is explained and the inclusion and exclusion criteria are described for each part of the study as well as the type of population selected for the study. The ethical considerations are outlined.

3.2 Study Design – Part A

Part A of the study was a retrospective record review. Following permission from the hospital manager and Department of Health, patient hospital files were retrieved using the inclusion and exclusion criteria. The files were reviewed to extract descriptive data for evaluation.

Retrospective record review can be used to determine prevalence, as demonstrated by several studies in the provided context: A study on oral cancer prevalence used retrospective chart review to estimate the prevalence of pain among treatment-naïve patients with oral cancer (Khawaja et al., 2020). The researchers found a pain prevalence of 67.5% among 1,067 participants with biopsy-proven oral cancer. In a study on adverse events in ambulatory care settings in Latin America, researchers used a retrospective focus to determine the period prevalence of adverse events (Montserrat-Capella et al., 2015). They found a prevalence of 5.2% (108/2080) [95% CI 4.2-6.1%] using this method. Interestingly, while retrospective record review can be useful for determining prevalence, its reliability and validity can vary.

A systematic review of the reliability and validity of adverse event detection with record review found that the inter-rater reliability of common record review methods was moderate to substantial, with pooled kappa values of 0.65 and 0.55 for two different methods (Hanskamp-Sebregts et al., 2016). However, the review noted that the validity of the record review method has never been evaluated.

Retrospective record review is a widely used and valuable method for determining prevalence in various medical contexts.

3.2.1 The following steps were taken to conduct the review:

3.2.1.1 Defining the Population

The population of interest for this study were children between the ages of five and 17 years who sustained simple upper limb fractures (ULF).

We ensured the sample is representative by selecting records that met the following specific inclusion criteria:

Part A

Inclusion Criteria

a. Children aged 5 years to 17 years
b. Record of a simple upper limb fracture

3.2.1.2 Data Extraction:

Data was systematically extracted for relevant data from the records. This included identifying cases that meet the criteria for simple ULF.

Challenges during this phase were:

1. Patient files recorded in the data lists in the Casualty, Emergency and Orthopaedic departments were missing or irretrievable from the administration records department.
2. Patient files from the Administration department were incorrectly categorized and had different patients' medical records hence did not correlate with the data sheets from the Casualty, Emergency, Orthopaedic and Physiotherapy departments.
3. Incomplete patient records with incomplete patient medical records resulted in missing essential medical information (diagnosis, management, and date of management).
4. The patient file numbers and/or identification numbers were incorrectly captured in the data sheets and hence did not correlate with the physical patient file or did not exist within the Administration department archives.
5. Lack of uniformity of data capturing and recording within the departments of the respective hospitals. The Casualty, Emergency, Orthopaedic and Physiotherapy departments at the hospitals do not have a uniform method of

capturing and recording their statistical records. The Casualty departments and Orthopaedics departments within the hospitals did not capture or keep detailed statistical records of the patient's ages, injury classification, burden of disease profile or treatment interventions. Majority of the statistic records simply recorded the patient's age range (under five years old, five to 18 years old, above 18 years old and above 65 years old).

6. The Casualty, Emergency and Orthopaedic departments categorized patients according to their status (MVA/PVA/PF or H classification) not according to the burden of disease, which was necessary for participant enrolment in both part A and part B of the study. This resulted in a sample size smaller than initially anticipated. However, the Physiotherapy departments recorded all patients in data sheets which specified diagnosis.
7. The statistic records within all Casualty, Emergency and Orthopaedic, and Physiotherapy departments at the 5 hospitals with detailed patient information were paper based and stored in non-secured storage units or cupboards, resulting in missing diaries, statistic books and missing patient registers in the 2019 to 2023 period. This occurred at Bethal Hospital and Bernice Samuel Hospital as the hospitals had recently undergone relocation and renovations.
8. A substantial portion of the files that had been successfully retrieved from the Administration departments presented with errors; incomplete or incorrect patient demographic details, incomplete or incorrect objective assessment notes, incomplete or incorrect subjective assessment notes, and incomplete or incorrect treatment notes, hence resulting in major discrepancies in clinical records. This resulted in a further loss of eligible files for record review and compromised the record keeping system
9. Administrative departments with electronic records had summarized statistics and total patient numbers, which could not be further traced down to individual patient.
10. The data officers in the Administration departments rely on data received from individual departments. There was no data verification system or back-up system that could be used in the event of patient file recording errors.

To limit these confounding factors, the researcher had to limit the data extraction to files obtained from the physiotherapy department as they were recorded in the data sheets.

3.2.1.3 Calculation of Prevalence:

Prevalence is typically calculated as the number of cases divided by the total number of individuals in the population, often expressed as a percentage or per 1,000 or 100,000 individuals.

Due to the limitations experienced by the lack of data for all children who sustained ULF's that presented to the emergency department, the researcher opted to use the valid data as provided by the physiotherapy department. This means that the prevalence of ULFs was limited to those who had been referred for follow-up physiotherapy.

3.2.1.4 Statistical Analysis:

The researcher used descriptive statistics to summarize the data. This included calculating the mean, median, and standard deviation for continuous variables, and frequencies and percentages for categorical variables.

The following data were analysed:

- demographics of participants
- type of injury,
- cause of injury, and
- location point prevalence simple upper limb fractures (ULF).

3.2.1.4.1 Confidence Intervals

The required sample size in the study design was set at 300 patient files in part A of the study however, only 234 files were retrieved. The study powered at 80% to estimate the difference was +/- 9%, in order to detect a point prevalence of 31% (25% - 37%) in the five hospitals.

3.2.1.4.2 Adjusting for Confounders:

The researcher used multivariate analysis techniques, such as logistic regression to adjust for potential confounders that affected the prevalence estimates for this study.

3.2.2 Procedure

The statistical records of children aged five–17 years with ULF from 2019 to 2023 were reviewed. The files of patients qualified according to the study inclusion criteria were requested from the hospital administration office. Parts A and B were conducted at the following data collection sites: Amajuba Memorial Hospital, Bernice Samuel Hospital, Bethal Hospital, Evander Hospital, and Witbank Hospital in Mpumalanga Province.

Part A:

The files were analysed to obtain details of the type of ULF.

- Bone fracture (humerus, ulnar/radius)
- Type of fracture
- Gender (male/female)
- Age at injury
- Cause of injury (fall during play/sport, motor vehicle accident, sport)
- Place of injury (home, school, public place/road traffic)

This study investigated the point prevalence of upper-limb fractures. This investigation involved the extraction of patient information from patient records of children aged five–17 years diagnosed with traumatic simple ULF through X-rays.

A retrospective review of all paediatric patients with ULF between January 2019 and August 2023 was conducted by the principal investigator. This period allowed for the collection of a sizeable number of patient files and cases.

3.2.3. File Retrieval

Data collection was initiated at the Amajuba Memorial Hospital (AMH), with only one data collection site. However, due to the limited number of participants within the first two months of data collection (November 2022 to January 2023), a request was made to the University of the Witwatersrand HREC and Department of Health Mpumalanga HREC to expand the data collection sites to four additional hospitals, resulting in a total of five data collection sites within Mpumalanga Province. The five data collection sites were Amajuba Memorial Hospital (AMH) (Volksrust, Mpumalanga), (BSH)

Bernice Samuel Hospital (Delmas, Mpumalanga), Bethal Hospital (BH) (Bethal, Mpumalanga), Evander Hospital (EH) (Evander, Mpumalanga), and Witbank Hospital (WH) (Witbank, Mpumalanga).

All hospital files under the casualty, orthopaedic, and physiotherapy departments were surveyed; however, due to technical errors in the hospital file record keeping system, only the statistical records of the physiotherapy department presented the most detailed and accurate record.

Information in the patient hospital files were captured electronically into RedCap, a statistical program used for data collection and analysis. The data were entered at each data-collection site visit by the principal investigator using a password-protected laptop. The hospital files were sifted to gather information regarding the frequency of point prevalence of paediatric simple ULF, types of fractures, cause of injury, place of injury, sex, and age at the time of injury, like the study conducted by (Safiejko et al., 2019).

Each hospital was initially visited by the principal investigator for a briefing with the hospital physiotherapy staff to communicate the aims and methodology of the research study. Thereafter, a second visit was scheduled at each hospital to review the patients' hospital files. Subsequently, the hospitals were visited once a month for each subsequent review of files.

3.3 Study Design – Part B

Part B was a study investigating quality of life as assessed using the PEDsQL



Figure 3.3: Methodology procedure for Part B

Inclusion criteria for participation in this study were:

Inclusion Criteria

i. Children aged 5 years to 17 years and were identified through the administration records of the physiotherapy departments at the five respective hospitals
ii. Record of a simple upper limb fracture
iii. Record of being assessed and or managed at the facility

Exclusion Criteria

i. Children with chronic medical conditions/illnesses and/or history of previous upper limb fractures

3.3.1 PEDsQL user agreement and permission for use of the tool.

No formal training is required for use of the questionnaire. However, the principal investigator was registered on the Mapi Research Trust database and issued with a user license agreement to conduct research and data collection using the PedsQL Generic Core Scales version in Afrikaans, English, Sotho and IsiZulu versions. The process of the licensing required reading and understanding of the PedsQL tool in order to gain skilled administration of the outcome measure.

3.3.2 Data collection

The data collection was conducted from November 2022 to August 2023 for PedsQL assessments. The investigator travelled to the data collection sites twice each month on the dates that most participants were scheduled for medical and/or physiotherapy rehabilitation at the hospitals, as communicated by the resident physiotherapists through in-person and/or telephonic communication with the potential participants' guardians.

3.3.3 Participant Enrolment

Each data collection site was visited fortnightly during the first three months of the data collection process. Participants were contacted telephonically and formally invited to participate in the study by the resident physiotherapists, identified through the data obtained from the respective physiotherapy departments during Part A of the study. Thereafter, the enrolled participants were examined or scheduled on an appointment basis.

Additionally, resident physiotherapists were contacted telephonically on a weekly basis to enquire about any newly identified potential participants in the orthopaedic wards, paediatric wards or Casualty, and to reschedule patients with missed appointments.

However, due to the Coronavirus disease (COVID-19) pandemic, there was noticeable decrease of out-patients attending physiotherapy rehabilitation services due to the national government restrictions limiting the public's ability to travel and move in groups hence influencing availability to attend physiotherapy appointments, resulting in poor participation in physiotherapy and overall decreased patient numbers. Additionally, physiotherapy staff had to prioritise in-patient over out-patient attendances. The study therefore had a reduced number of enrolled participants in part B of the study during the data collection period of 2019 to 2023 due to COVID and post-COVID implications.

3.3.4 Consent/Assent

On the day of the initial assessment, the researcher explained the purpose of the study to participants and caregivers. Those who consented to participate were provided with participant information sheets and consent forms.

The participant's parents/caregivers/guardians were requested to provide written consent prior to enrolment of the participants into the study. Verbal assent was obtained from children younger than eight years of age after the procedure was explained thoroughly to them by the principal investigator. All caregivers and participants were provided an opportunity to ask questions to provide clarity where appropriate. The process of using the questionnaire was explained to participants and caregivers.

3.3.5 Language of PedsQL Questionnaire

The most frequently spoken language of Mpumalanga is as follows: 72.38% isiZulu, 15.77% Afrikaans, and 4.41% English speakers (Department of Statistics, South Africa, 2011). The PedsQL was made available in all three of these main languages: isiZulu, Afrikaans, and English as the developers have already translated the tool. The principal investigator explained the form in English and isiZulu. When required, an Afrikaans-speaking hospital staff member was requested to assist with translation during the assessment. Based on the guardian and participant's preference, the PedsQL form was issued in the language of their choice.

3.3.6 Administration of PedsQL Questionnaire

On arrival for their appointment, the rules of the questionnaire and outcomes of the PedsQL were explained to the participant and caregiver/guardian. The principal investigator also answered queries raised prior to starting the questionnaire.

The guardians were present during the assessment and completed the parent-proxy questionnaire on behalf of the children aged five to seven. However, the children aged eight to 17 years completed their own questionnaires under the supervision of the caregiver. In addition, the principal investigator took anthropometric measures (height and weight) of each participant and recorded on the data collection sheet. Measurements were also captured on the RedCap data collection system

As per the PedsQL™ recommendations, the PedsQL™ was administered before the participants completed any other health assessments and before they consulted a physician or other healthcare provider for treatment. The participants' guardians, adolescents (8-12 age group), and teenagers (13-17 age group) self-administered the

PedsQL™ following initial instructions from the principal investigator. Where the principal investigator determined that the child or teen was unable to self-administer the PedsQL (e.g. due to illness, fatigue, or reading difficulties), the PedsQL was read aloud for the participant. For the child (5-7 age group), the PedsQL™ was administered by reading the instructions and questions word for word.

Furthermore, to avoid suggesting answers, the reading voice was maintained neutral. If a child had difficulty understanding the age appropriate PedsQL, the preceding age group version was administered to the participants (e.g., administering the (5-7 age group) Self-Report version to an eight-year-old.

However, if a child presented with moderate to severe cognitive impairment (as suspected by the principal investigator), the PedsQL was deemed not appropriate for that participant. In such cases, only the parent–proxy report was administered to the participant's guardian. Additionally, guardians and participants completed the questionnaires independently of one another. The principal investigator discouraged guardians, participants, and other family members from colluding with each other during the completion of the questionnaire. When administering the questionnaire, the child was instructed to face away from the parent. If the child or parent had a question about what an item means or how they should answer it, the investigator did not interpret the question for them but only repeated the item verbatim and asked them to answer the item according to what they thought the question meant. If they had trouble deciding on an answer, the principal investigator asked them to choose the response closest to how they felt. The participant and/or guardian had the option of not answering a question if they truly did not understand it.

Furthermore, when a parent/child asked the principal investigator to interpret the responses, the principal investigator had to tell her/him that they were not trained to interpret or provide a score for the answers. In the event of non-compliance, the principal investigator documented all reasons for refusal and non-compliance with the PedsQL™.

Upon administering the PedsQL™, the investigator explained it in simple terms and provided the respondent with a pen or pencil and a solid writing surface. The principal investigator remained nearby to answer the questions or concerns.

When the guardian and/or participant returned the PedsQL™, the document was checked to see that all answers had been completed, and if any responses were incomplete, illegible, or there were multiple responses for an item, the guardian or participant was asked to indicate their response.

The principal investigator asked the participants if they had any difficulties completing the questionnaire or if they had any other comments regarding the questionnaire and documented any important feedback. Thereafter, the principal investigator had to appreciate the parent and child for taking the time to complete the questionnaire and indicating when they could expect to be contacted again.

Furthermore, the participants were taken to dietician offices to measure their weight and height and establish their body mass index (BMI). Their heights and weights were recorded on data sheets. The World Health Organization BMI-for-age chart for girls and BMI-for-age chart for boys was used to establish their scores The BMI score was calculated using the weight in kilograms divided by the square height in meters, it was recorded onto their data sheet.

Children with a BMI score less than the 5th percentile and a standard deviation less than –2 was - categorised as underweight, children between the 5th and 84th percentile as healthy weight, children between the 85th and 95th percentile, with a standard deviation above +1 – were defined as overweight, and children at or above the 95th percentile and with a standard deviation above +2 were categorised as obese. The BMI-for-age BOYS chart and BMI-for-age GIRLS chart by the WHO (World Health Organization) are used to determine BMI score.

The remodelling phase occurs when the hard callus is reabsorbed by osteoclasts and deposited by osteoblasts and occurs after three–four weeks (Liebs et al., 2021). Thereafter, the participants were contacted for re-assessment four weeks, after their immobilisation cast was removed. The follow-up re-assessment was booked on the day the participants were scheduled for routine physiotherapy rehabilitation, as

communicated by the resident physiotherapist. The remodelling phase occurs when the hard callus is reabsorbed by the osteoclasts and deposited by the osteoblasts, this process occurs after three to four weeks (Liebs et al., 2021). In the event of low physical functioning scores, the resident physiotherapists thereafter continued with assessments after immobilization to establish if further physical functioning outcomes such as loss of muscle strength (using the Medical Research Council muscle scale), decreased range of motion (using goniometry) or other physical functioning limitations had occurred.

3.4 Instrumentation

Table 3.4: Instruments and outcome measures

Outcome Measure	**Description**
PedsQL 4.0 Generic Core Scales	This is a 23-item assessment questionnaire tool which evaluates the health-related quality of life (HRQOL) in children who are healthy and children with acute and chronic conditions. PedsQL looks at four scales - physical functioning (8 items), emotional functioning (5 items), social functioning (5 items) and school functioning (5 items). This will give us an overview of the participants' quality of life and the effects it has on their physical activity. The University of the Witwatersrand Department of Physiotherapy has obtained permission and license to utilise the PedsQL for clinical practice and research.
Digital Body Weight Scale	A device for measuring weight, often of a person. Balances measure the mass of an object and are used in science to obtain the mass of an object.
Stadiometer	A piece of medical equipment used for measuring human height. It is usually constructed out of a ruler and a sliding horizontal headpiece which is adjusted to rest on top of the head.

Following the scheduled appointment, participants and guardians were financially reimbursed with R30 per person for their return trip transportation. The guardians of the participants were required to sign and acknowledge the receipt of financial reimbursement.

3.5 Ethical Consideration

Ethical approval for this study was obtained from the WITS Human Research Ethics Committee (M220711). Permission was obtained from the WITS Department of Physiotherapy, WITS Faculty of Health Science, Mpumalanga Department of Health, and the Chief Executive Officers (CEOs) of the Amajuba Memorial Hospital, Bernice Samuel Hospital, Bethal Hospital, Evander Hospital, and Witbank Hospital.

The Declaration of Helsinki (DoH) ethical guidelines were adhered to, as participants' anonymity and confidentiality were highly prioritised (World Medical Association (WMA), 2009). This occurred through numerical participant numbers being used for identification, and information sheets with separate consent forms were distributed to primary caregivers of the selected children. Personal information was treated with the strictest confidence, and personal information was only made available to the Principal Investigator and postgraduate student supervisor.

Informed consent was obtained from the guardians of the participants to include the child in the study. An information sheet with separate consent forms was signed by each of the participants' parents, and participants were requested to give their assent to participate in the study. The participants were only enrolled in the study after obtaining both consent and assent.

Additionally, the participants were ethically scheduled for research study assessments on their routine dates of medical and/or physiotherapy treatment to avoid unnecessary absenteeism from school by the participants and from work by the participants' guardians. Furthermore, the participants were contacted and scheduled for research study follow-up assessments during school holidays according to the Mpumalanga Department of Education school calendar.

3.6 Data Analysis

3.6.1 Part A – Data Analysis

The retrieved information from the files was captured electronically using the RedCap system and uploaded to a password-protected computer laptop device. RedCap is (POPI) POPI-compliant, and all personal identifiers are hidden. Access to physical and electronic data was restricted to the principal investigator and the research supervisor.

Data were captured electronically from RedCap to STATA (Stata Corp., USA) statistical software for data science and analysis. Data backups were made to ensure the safety and secure storage of the data. The principal investigator compared and analysed the data.

The required sample size in the study design was set at 300 patient files in part A of the study however, only 234 files were retrieved. The study powered at 80% to estimate the difference was +/- 9%, in order to detect a point prevalence of 31% (25% - 37%) in the five hospitals.

3.6.2 Part B – Data Analysis

Additionally, descriptive quantitative data obtained from the participants in Part B were captured using RedCap and imported to STATA for analysis. Descriptive statistics were used to analyse the data, and the distribution of continuous variables (e.g. age, year of injury, height, weight, and PedsQL scores) was tested using the Shapiro–Wilk test for normality. Continuous variables are summarised as mean and standard deviation (SD) (normally distributed) or median and interquartile range (IQR) (not normally distributed). Categorical variables (e.g. type of fracture, place of injury, classification of fracture, and sex) were summarised using frequencies and percentages.

The data obtained from the PedsQL study were analysed based on how many individuals fall under the percentile and looking at the mean and mode to determine the presence of a statistical or significant difference.

3.7 Chapter Summary

In this chapter, all sections thoroughly discuss the methodological process undertaken in the study.

CHAPTER 4: RESULTS

This chapter describes the results of Parts A and B, summarises the data collected, and presents the findings of the study.

4.1 Data Collection Process

Following the commencement of data collection at the five hospital sites, 234 hospital files categorized as paediatric patient records with upper limb injuries were retrieved from the various admin offices at each hospital. Of the 234 hospital files, 124 were incorrectly categorized as adults or incorrectly classified and instead presented with lower limb injuries. The remaining 110 paediatric hospital files were reviewed, of these 110 paediatric hospital files using the inclusion criteria, 72 hospital files were identified as eligible for Part A of the study. Thereafter, 12 participants were enrolled in Part B of the study based on the inclusion criteria and availability of participants. Figure 4.1 presents a flow chart of the process of hospital file review and identification of eligible participants for Parts A and B of the research study.

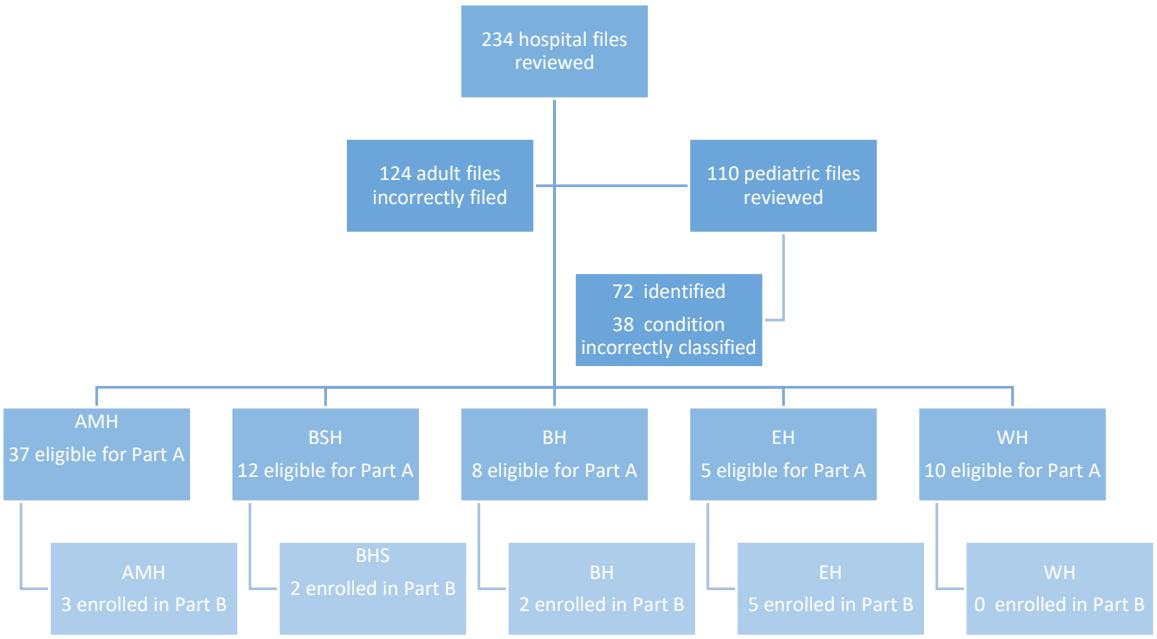

Figure 4.1: Data collection and participant enrolment

Baseline demographics

Two hundred and thirty-four hospital files were retrieved with the initial extraction where 124 were incorrectly identified as paediatric patients, thus only 110 could be used. Of these 110, 72 met the inclusion criteria for Part A of the research study.

Objective one of this study was to establish the baseline demographics of children with simple ULF living in a rural part of Mpumalanga. The age of the participants at the time of injury in Part A of the study ranged from birth to 16 years, following the inclusion criteria of this study only those older than five years were included for statistical analysis.

Part A indicated a 31% prevalence for children with upper limb fractures living in a rural part of Mpumalanga. The study powered at 80% to estimate the difference was +/- 9%, in order to detect a point prevalence of 31% (25% - 37%) in the five hospitals.

The statistical results of this study indicated that the 6–12-year age group presented the highest number of recorded injuries at 40.74%, indicating a high probability of injury within the toddler and pre-pubescent age groups. It was followed by the 13-17 years age group scoring the lowest number of traumatic injuries at 27.78%. Interestingly, the 0-5 years age group presented with the second highest number of injuries at 31.28%,

Additionally, the sex distribution of the participants was 62.71% males (37 participants) to 37.29% females (22 participants). Overall, the number of upper-limb injuries among male children was higher than that among female children. The data indicate an increased injury probability among males, as compared to females.

4.2 Types of fractures

The study findings indicated that the elbow was most frequently injured, with supracondylar fractures accounting for most fractures at 30.30% of paediatric upper limb injuries. Additionally, forearm fractures were the second most common injuries, with radius fractures accounting for 16.67%, of the cases, and combined radius and

ulnar fractures accounting for 12.12%. Furthermore, humerus fractures located in the upper arm accounted for 6.06% of the paediatric ULF. Injuries of the hand and fingers had the lowest frequency, with metacarpal fractures accounting for 3.03% and phalanx fractures accounting for 3.03% of paediatric ULF within the research study population.

The classification of paediatric upper limb injuries consisted of dislocations (1.85%), displaced fractures (42.59%), multiple fractures (undisplaced and displaced) (1.39%), soft tissue injuries (16.67%), and undisplaced fractures (35.19%). Therefore, displaced upper fractures are the most frequently recorded upper limb injuries among children in the population.

4.3 Cause of injury

The most common form of injury was falls, accounting for 84.62% of injuries within the population. The findings of the study indicated that the cause of injury was 25% from a fall during play, a percentage of 51.92% from falls occurring spontaneously, and 7.69% from sports injuries. Motor vehicle injuries accounted for 1.92%, assault at 1.92%, and pedestrian vehicle accidents and congenital deformity at 3.85%, and 1.92% respectively.

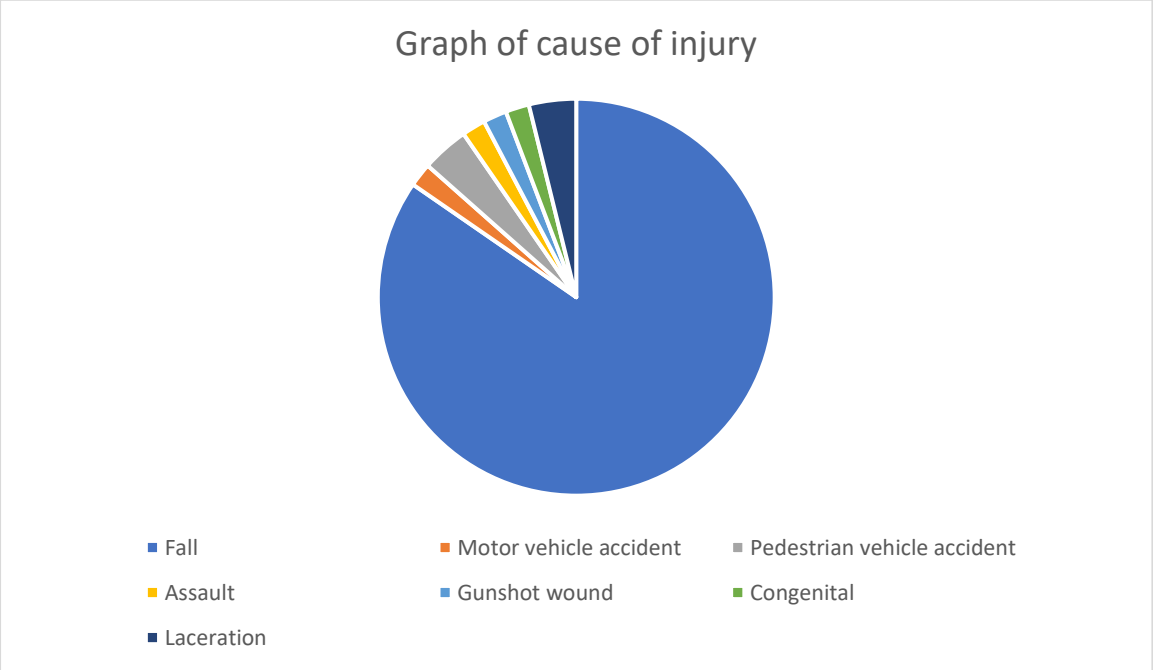

Figure 4.3: Graph indicating cause of injury in participants.

4.4 Place of injury

The participants' home environment was the most common place of injury for children with ULF in this study population. The place of injury point prevalence was 29.41% at school, 66.66% at home, 1.85% on the road, and 1.85% in a public centre. Therefore, children with injuries in this population have a higher probability of sustaining an injury at home than in other environments.

4.5 Management of fractures

During Part A of the study, patient files were retrieved to establish the management of upper-limb fractures incurred by children in hospitals in rural Mpumalanga, South Africa.

The most used orthopaedic management was a back slab alone, accounting for 25.93%. Overall, the back-slab method in combination with other interventions accounted for 64.81% of the patient records.

Many of the participants at 61.11% reported that they had received conservative management, while 38.89% of the hospital files reported that they had received surgical management. However, approximately 25% of the patient records indicated that physiotherapy intervention was not introduced for children with low physical functioning scores, and patients had no prescribed physiotherapy treatment.

Table 4.5 below, indicates the medical treatment intervention categories that were administered according to the hospital files for participants in Part A.

Table 4.5: Medical treatment interventions administered to participants in Part A.

Intervention	**Frequency**	**Percentage (%)**
Arm sling	3	5.56
Back slab, POP & Arm sling	1	1.85
Back slab	14	25.93
Back slab & Arm sling	1	1.85
Back slab & POP	5	9.26
Back slab, ORIF & K-wire	1	1.85
Closed reduction & Back slab	2	3.70

Debridement & splinting	1	1.85
Debridement, partial amputation & k-wire	1	1.85
K-wire & back slab	2	3.70
K-wire & POP	1	1.85
K-wire, back slab, POP & splint	1	1.85
ORIF	2	3.70
ORIF & back slab	3	5.56
ORIF, POP & arm sling	1	1.85
ORIF, back slab & POP	1	1.85
Open reduction & back slab	1	1.85
Open reduction, K-wire & back slab	2	3.70
Open reduction, ORIF & back slab	1	1.85
POP only	7	12.96
Physiotherapy only	1	1.85
Splint	1	1.85
Zhimer's splint	1	1.85

Overall, immobilisation was predominantly used in the management of fractures in the population, and the duration of immobilisation ranged from four to 12 weeks, depending on the degree of the fracture. This method is consistent with the primary form of management and treatment for ULF among children in the Mpumalanga province.

4.6 Physiotherapy interventions

Additionally, during the review of the patients' hospital file records, it was established that 75% had recorded physiotherapy screening notes in their hospital files. While the remaining 25% of patient hospital files had no recorded physiotherapy screening notes in their hospital files

PART B

Part B was a clinical research study in which children aged five to 17 years who presently have simple ULF, were assessed using the PedsQL outcome measure tool.

The children were identified through the administration records of the physiotherapy departments at the five respective hospitals.

4.7 Mechanism of Injury

Of the participants enrolled in Part B, 75% reported injuries occurring at home. Additionally, 83.33% reported the cause of injury as a fall, 8.33% as a motor vehicle accident and another 8.33% as a pedestrian motor vehicle accident. This confirmed the findings of Part A that indicated the participants' home environment as the most common place of injury.

Of the 12 participants, 50% sustained supracondylar fractures while the remaining participants sustained various fractures to the humerus, radius, olecranon, and ulnar bone regions.

Table 4.7: Medical treatment interventions administered to participants in Part B.

Intervention	**Frequency**	**Percentage (%)**
Backslab & POP	11	91.67
POP only	1	8.33

4.8 PEDSQL Scores

The results of the PedsQL amongst the participants indicated low scores in all four of the PedsQL functioning sections.

The Physical Functioning score mean of the participants was 15.50 out of a total of 32 points, with a standard deviation of ±7.85, and a p value = 0.75, indicating that the data is normally distributed according to the Shapiro-Wilk test for normal data. The average percentage score is 48.43%.

The Emotional Functioning score mean of the participants was 10.10 out of a total of 20 points, with a standard deviation of ±3.96, and a p value = 0.75 , indicating that the data is normally distributed according to the Shapiro-Wilk test for normal data. The average percentage score is 50.5%

The Social Functioning score mean of the participants was 12.67 out of a total of 20 points, with a standard deviation of ±4.10, and a p value = 0.75, indicating that the data is normally distributed according to the Shapiro-Wilk test for normal data. The average percentage score is 63.35%.

The School Functioning score mean of the participants was 12.42 out of a total of 20 points, with a standard deviation of ±5.07, and a p value = 0.75, indicating that the data is normally distributed according to the Shapiro-Wilk test for normal data. The average percentage score is 62.1%.

The PedsQL Total score mean of participants was 50.67 out of a total of 92 points, with a standard deviation of ±17.42. The data has a p-value of 0.75, indicating that the data is normally distributed according to the Shapiro-Wilk test for normal data. The average percentage score is 55.08%.

The section with the highest average percentage score was Social Functioning at 63.35%.

According to the PedsQL tool, low scores in a functioning category indicate a low quality of life in the functioning category. This indicates that the functioning sections that were most affected by simple upper limb fracture injuries for children in this research study are physical functioning and emotional functioning.

The following table (Table 4.3.1) indicates the physical functioning, emotional functioning, social functioning, and school functioning scores obtained by participants in Part B of the study, followed by a summary in Table 4.3.2.

Table 4.8.1: PedsQL Scores of Participants in Part B

PARTICIPANT	**PHYSICAL SCORE (32)**	**EMOTIONAL SCORE (20)**	**SOCIAL SCORE (20)**	**SCHOOL SCORE (20)**	**TOTAL PEDSQL SCORE (92)**
1	14	7	8	12	41
2	16	4	4	6	30
3	7	7	13	7	34
4	5	9	9	3	26
5	20	10	10	13	53
6	24	18	16	16	74
7	16	8	14	15	53
8	16	14	16	20	66
9	13	9	14	14	50
10	20	12	14	18	64
11	4	8	16	10	38
12	31	15	18	15	79

Table 4.8.2: Summary of PedsQL Scores of Participants in Part B

	Mean	**SD**	**95% confidence interval**
Physical Functioning Score (0 to 32)	15.50	±7.85	10.52 – 20.48
Emotional Functioning Score (0 to 20)	10.10	±3.96	7.58 – 12.62
Social Functioning Score (0 to 20)	12.67	±4.10	10.06 – 15.27
School Functioning Score (0 to 20)	12.42	±5.07	9.17 – 15.66
Total PEDSQL Score (0 to 92)	50.67	±17.42	39.60 – 61.74

4.9 Body mass index

The findings of the study identified ten children between the 5th to 84th percentile as healthy weight and two children between the 85th and 95th percentile, with a standard deviation above +1 defined as overweight and above +2 as obese. The following table (Table 4.4) indicates the age, sex, weight, and height of the participants to calculate BMI.

Table 4.9: Anthropometric measurements of participants

Participant	Age (in years)	Sex	Weight (in kg)	Height (in meters)	BMI
A	14	Male	45.00	1.55	18.70
B	6	Male	20.60	1.15	15.60
C	15	Female	47.50	1.38	24.90
D	11	Female	38.30	1.38	20.10
E	16	Male	69.10	168.00	24.50
F	7	Male	22.40	122.00	15.00
G	10	Male	31.50	139.00	16.30
H	5	Female	20.10	117.00	14.70
I	10	Male	29.90	1.36	16.10
J	6	Male	22.80	123.00	15.10
K	9	Male	27.60	134.10	15.30
L	5	Female	20.00	1.08	17.10

Upon plotting the scores using the WHO growth charts, the participants enrolled in Part B of the study, ten of the participants were classified as ideal healthy weight, with two being classified as slightly overweight. This indicated that the children with ULF did not exhibit scores within the obese category, hence the increased weight component did not contribute to the ULF.

4.10 Chapter Summary

The highest number of injuries occurred in the 6-12 year age group, then 0-5 group, and the 13-17 years group reporting the least number of injuries. Findings highlighted that males were at an increased risk of fracture. Supracondylar fractures are most common and were due to falls that happen in, the home. Immobilization was the most

common form of treatment intervention often used in isolation or in conjunction with surgical interventions.

The PedsQL scores averaged low in all four sections: physical functioning, emotional functioning, social functioning, and school functioning. Specifically, physical functioning and emotional functioning sections had the lowest scores with the lowest average percentage of 48.43% for physical functioning and emotional functioning at 50.50%.

This chapter detailed and presented the research study findings.

CHAPTER 5: DISCUSSION

The purpose of this chapter is to discuss the interpretation and implications of the research findings, and limitations of the study.

5.1 Interpretation of Part A

5.1.1 Baseline Demographics

Upper limb fractures are commonly occurring injuries within the paediatric population. However, in comparison to literature on paediatric lower limb fractures, there is extremely limited research in South Africa regarding the demographics and point prevalence (i.e. frequency of point prevalence, most common form of management, referral rate to physiotherapy, common age of point prevalence, sex distribution and place of point prevalence) of paediatric ULF, particularly in rural Mpumalanga, South Africa. This study contributed to establishing baseline demographics of children incurring ULF and the point prevalence of ULF of children living in rural South Africa.

According to the study, Part A indicated a 31% prevalence for children with upper limb fractures living in a rural part of Mpumalanga, in the five communities serviced by the five hospitals. This indicates that the prevalence of ULF within the population is a significant occurrence, with a 31% prevalence. Hence investigating baseline demographics, type of fracture, cause of fracture, place of fracture, management of fracture and physiotherapy intervention of ULF is a necessity to further understand the prevalence.

This study indicated the 6-12 years age group presented the highest number of recorded injuries at 40.74%. The 0-5 years age group presented with the second highest number of injuries at 31.28%, followed by the 13-17 years age group scoring the lowest number of traumatic injuries at 27.78%. These findings are synonymous with the findings in Strydom, et al., 2020, where the 6-12 years age group also scored the highest number of injuries, followed by the 0-5 years age group with the second highest and the 13-17 age group with the lowest number of injuries within the age group. This is due to children in the 6-12 age group presenting with increased independence, increased mobility, and high levels of curiosity. However, at this age,

these children had not fully grasped the cognitive ability to identify harmful environments and avoid hazards.

Furthermore, this study indicated a significant increased number of upper limb fracture injuries in the paediatric male population compared to the paediatric female population, with 62.71% males and 37.29% females identified during the study. These findings are supported by a study by Valerio et al., 2010, which highlighted that males were at an increased risk of fracture in all age groups, compared to girls. However, it was noted that the highest frequency of fractures occurred for boys at 12 years of age, while for girls it occurred at nine years of age. This indicates that the incidences of injury amongst school going children is highest for older adolescent males while lower for their female counterparts. These findings were consistent with the findings in a similar study by Safiejko et al. (2019), which identified the reasons for the increased fracture rate in boys has been accounted to the high involvement of boys in contact and high impact outdoor play. The study by Valerio et al. (2010) also indicated that due to behavioural differences, school going children within the male population were more physically active than their female counterparts, while no differences were noted in pre-school children.

5.1.2 Type of fractures

The findings of the study also indicated that displaced fractures accounted for 42.59%, while the undisplaced fractures accounted for 35.19% of upper limb injuries in the paediatric population. Additionally, the findings of the study indicated increased supracondylar fractures were caused by falls within the population, accounting for the highest percentage. Therefore, this is like the findings by Arora et al., 2014, which indicated that supracondylar fractures account for majority of ULF in the paediatric population, primarily occurring in the first ten years, and peaking between children five to seven years old (Arora et al., 2014), with the most common mechanism due to hyperextension of the elbow during a fall.

5.1.3 Cause of injury

The findings of the study indicated that majority of the falls, accounting for 84.62% resulted due to falls occurring spontaneously, with play or during sports. This is due to increased physical activity levels among children hence increasing probability of falls.

Play facilitates development of fine and gross motor skills. Physical play stimulates multiple facets including language development, socialization skills, communication of emotions, problem solving, and creativity as identified by (Anderson et al., 2010). This multitude of benefits to physical playing for children is important in healthy brain development, they gain majority of their knowledge and ability to think, remember and problem solving through play. Additionally, children have developing gross motor skills and developing balance, hence there is a high likelihood of loss of balance and falls.

5.1.4 Place of injury

The main place of injury in this study group was identified as the home of the participants. Similarly, the findings by Valerio et al. (2010), indicated that the locations where fractures commonly occurred were reported that the home accounts for majority of injuries, these findings reflect the amount of time that children in rural communities spend at home. This differs from a similar study by Safiejko et al. (2019), which highlighted school as the main place of injury due to schools encouraging involvement in sports and physical activity.

However, according to a study by Travill and Wildschutt (2019), schools in rural populations do not have designated sports policies and the available sports such as schools in urban communities. This is often due to lack of finances, physical infrastructure and human resources in schools based in rural communities. As a result, children often participate more in physical activity and physical play at home, rather than in the school environment. (Arora et al., 2014).

5.1.5 Management of fractures

Conservative treatment in most upper-extremity fractures includes analgesic pain control, immobilization in a splint or cast, and facilitation of return of activity, provided that the fracture is not mal-aligned, according to a similar study by (Arora et al., 2014). This is consistent with the findings of this study; immobilization continues to be the most common form of treatment intervention used for paediatric patients with ULF in rural Mpumalanga. Immobilization is often used in isolation or in conjunction with surgical interventions.

5.1.6 Physiotherapy interventions

Furthermore, the study indicated the need for physiotherapy rehabilitation advocacy for pediatric patients with low physical functioning scores with ULF as during the review of the patient files and records, it was established that 53 of the 72 patient files had recorded physiotherapy screening notes in their hospital files, accounting for only 73.61%. However, the remaining patient files had no recorded physiotherapy screening notes in their hospital files, accounting for 26.39%, the participation in physiotherapy rehabilitation was absent in the patient files.

A study by M'kumbuzi et al. (2009), indicated similar findings of patient hospital file errors. While conducting the research study in Mpumalanga, South Africa, it was found that there is little to no uniformity of patient filing, storage, and retrieval amongst clinicians in both private and government institutions. As a result, there is poor retrieval of physiotherapy assessment and treatment records, particularly in government institutions within South Africa. The study found that more than 65% of physiotherapy patient records could not be successfully retrieved due to incorrect or absent information hence compromising the record keeping system and impacting clinical and research capacity. According to a similar study by Strydom et al. (2020), a total of 205 (28%) patients were excluded from the research study due to incomplete records or missing files, indicating a decline in note keeping by the healthcare providers and limited accuracy in data capturing by the relevant clerks.

Overall, these findings provided statistical data that gave insight for health care professionals. Similarly, the findings by Valerio et al. (2010), indicated that the incidence of paediatric fractures can be lowered through informative education of the public, strategic implementation of safety interventions, and national and provincial government legislation. Medical specialists and health care professionals can be highly instrumental in decreasing the incidence of paediatric injuries by participating in deliberate education, research, and intervention programs that promote secure play. These crucial findings were identified as tools to assist health care professionals to better educate patients and their guardians towards prevention of injury and associated complications.

5.2 Interpretation of Part B

Previous literature outlines the effects of ULF on physical activity levels, as explored by (Stevens et al., 2012). However, there are no known studies that investigate the effects on overall quality of life of children living in rural Southern Africa, following an upper limb fracture. This study investigates the effects of simple ULF on the health-related quality of life and how simple ULF impact activities of daily life and play in children (Liebs et al., 2021).

5.2.1 PedsQL Scores

According to the PedsQL tool, low scores in a functioning category indicate a low quality of life in the specific functioning category. The quality-of-life scores of the research study participants averaged low scores in all four sections: physical functioning, emotional functioning, social functioning, and school functioning.

The physical functioning score mean of the participants was an average percentage score of 48.43%. The emotional functioning score mean was an average percentage score of 50.5%. The social functioning score mean was an average percentage score of 63.35%. And the school functioning score was an average percentage score of 62.1%.

Furthermore, physical functioning and emotional functioning sections had the lowest average percentage scores amongst the participants, with the lowest scores for physical functioning and emotional functioning. The section with the highest average percentage score was social functioning. This therefore indicates that the functioning sections that were negatively affected by simple upper limb fracture injuries for the children assessed are physical functioning and emotional functioning as shown by the low scores of PedsQL results.

The decreased scores in physical functioning can be attributed to the decreased ability of the child to participate in personal grooming and household chores. According to a study by Jha et al, children in low-income community backgrounds are more likely to be expected to participate in daily household activities from early periods, as

compared to children in high income community backgrounds this results in increased frustration with immobilization limitations (Jha et al., 2018).

Children in rural populations participate more in physically active play, compared to their counterparts in urban communities with access to virtual and electronic play. Therefore, a decrease in their physical capacity directly impacts their capacity for participation in play, hence directly impacting their physical and emotional wellbeing. According to a study by Strydom et al. (2020), international recommended guidelines suggest that school-going aged children are expected to participate daily in at least 60 minutes of moderate-to-vigorous intensity activity, however. Active play facilitates healthy physical movements and improves physical health. According to a similar study by Hijkoop et al. (2021), it was identified that girls have lower scores in the PedsQL assessment compared to boys, particularly in the physical functioning section.

Physically active play is important as it assists children to adjust and learn of basic social skills, while exploratory play allows children time to discover and manipulate their surroundings. Additionally, children with traumatic injuries experience changes in their emotional wellbeing as indicated by a study by (Jones et al., 2021). This is due to the psychological impact and post-traumatic stress symptoms. The psyche of children is vulnerable due to it being in the development stages, hence their mental health is affected by the changes in appearance, roles in the home, household responsibilities and chores, friendships, and participation (Jones et al., 2021). This is therefore associated with low emotional functioning scores in the PedsQL scores.

5.2.2 Body Mass Index

The BMI scores of participants were assessed and analysed according to the WHO BMI charts for age. According to a study by Li et al. (2020), there is an increased length of hospital stay for children with higher BMI scores. Additionally, similarly to a study by Nhan et al. (2021), in comparison to children with normal weight, ULF are more common in overweight and obese children due to low energy mechanics. It was observed that obesity and inactivity predisposed children to poor postural balance and decreased coordination, therefore resulting in increased risk of falling.

However, the findings of the study indicated that the children with ULF did not exhibit scores within the obese category hence the weights component did not contribute to the ULF.

5.2.3 Physiotherapy Referral

Overall, physiotherapy will improve the rehabilitation process for children with low physical functioning through prevention, identification through assessment, treatment, referral to associated members of the multi-disciplinary team, reorientation, resettlement and integration into their life and community.

Therefore, it is essential to advocate for early physical therapy and rehabilitation for children with low physical functioning scores to restore physical function to improve their capacity to participate in personal grooming, household chores and active physical play. This can be achieved by educating the relative stakeholders about the role and benefit of physiotherapy for children with low physical functioning, as well as to improve physiotherapy referral pathways within all clinics, hospitals, and health care facilities. Also, the study's findings indicated a need to improve the referral pathways of physiotherapy intervention in children with simple ULF presenting with low physical functioning. This will contribute towards the holistic medical management of the patient's condition and involvement of all necessary members of the multidisciplinary team.

According to a study by Bruder et al. (2011), physiotherapy treatment commonly utilizes exercise in conjunction with other interventions to decrease physical impairment and increase activity during the physical rehabilitation of patients with ULF. Prescription of exercise is a necessity for the management of a fracture management and is highly associated with decreased physical impairment and increased activity after distal radius fracture. Physiotherapy early exercise early intervention was found to be beneficial in patients with conservatively managed proximal humeral fractures, as identified by Bruder et al. (2011). It was also identified that physiotherapy exercise contributes to increase wrist range of movement in patients with conservatively managed distal radius fractures.

Therefore, physiotherapy intervention will prevent further complications and promote healing and recovery. The involvement of physiotherapy will treat physical symptoms

and encourage movement necessary for reintegration and return to normal physical function.

5.3 Study limitations

The research design of part A of the study is classified as a retrospective record review and heavily relies on the use of patient hospital files and hospital statistical records for the effective and efficient collection of data. Additionally, the research study methodology enrolment of participants for part B of the study relies on the identification of participants during the retrospective record review in part A of the study.

5.3.1 Retrieval of data

A limitation of the study was the initial retrieval of patient reports, statistics, and files to initiate the data collection process. This was a major difficultly with record reviewing as there was many files that were missing, while those that were successfully collected from the administration offices were either incorrect or incomplete. The retrospective record review process was heavily affected due to erroneous record keeping, the overall number of files retrieved for part A and hence the enrolment of participants in part B of the study was affected. The patient file numbers in the statistic records often did not correlate with the physical files upon collection at the administration office. The patient file numbers were often incorrectly captured and hence did not correlate with the physical patient file or did not exist at all within the administration office archives.

5.3.2 Uniformity of data

The second limitation was the lack of uniformity of data capturing and recording within the departments of the respective hospitals. The casualty departments, orthopaedic departments and physiotherapy departments at the hospitals do not have a uniform method of capturing and recording their statistical records. The casualty departments and orthopaedics departments within the hospitals did not capture or keep detailed statistical records of the patient's ages, injury classification, burden of disease profile or treatment interventions. Majority of the statistic records simply recorded the patient's age range (under five years old, five to 18 years old, above 18 years old and above 65 years old). Additionally, the statistic records in the department categorized patients according to their out-patient or in-patient status, therefore resulting in total

numbers of paediatric in-patients or out-patients but not specific distribution according to the burden of disease, which was necessary for participant enrolment in both part A and part B of the study. This resulted in a sample size smaller than initially anticipated.

5.3.3 Storage of data

The statistic records within the physiotherapy departments with detailed patient information are paper based and stored in non-secured storage units or cupboards. Some of the physiotherapy departments captured statistics in diaries, some in the statistical record books, hence resulting in missing diaries, statistic books and missing patient registers in the 2019 to 2023 period.

However, despite number of participants being limited, data saturation was reached and prominent issues essential for the study were highlighted.

5.3.4 Discrepancies in clinical notes

A substantial portion of the files that had been successfully retrieved from the administration offices presented with errors; incomplete or incorrect patient demographic details, incomplete or incorrect objective assessment notes, incomplete or incorrect subjective assessment notes, and incomplete or incorrect treatment notes, hence resulting in major discrepancies in clinical records. Therefore, this resulted in a further loss of eligible files for record review. Due to the ripple effect through erroneous record keeping, the overall number of files retrieved for part A and hence the enrolment of participants in part B of the study was affected. The occurrence of incorrect and/or absent note compromises the record keeping system and impacts the use of the captured notes for both clinical and research capacity.

5.3.5 COVID-19 impact

Additionally, the fifth limitation of the study was the decreased number of participants in part B of the study during the data collection period of 2019 to 2023 due to COVID and post-COVID implications. Due to the COVID-19 pandemic, there was noticeable decrease of patients attending physiotherapy rehabilitation services due to the national government restrictions limiting the public’s ability to travel and move in groups hence

influencing availability to attend physiotherapy appointments, resulting in poor participation in physiotherapy and overall decreased patient numbers.

Additionally, to prevent the spread of the COVID-19 pandemic, strict national government restrictions prohibited the gathering of multiple people in an enclosed space. A limited number of participant appointments, with specific appointment times could be scheduled for each data collection session hence negatively influencing the enrolment of a control group.

Furthermore, due to the COVID-19 pandemic, out-patient care was affected due to diverted attention from out-patient care to acute in-hospital care with emphasis on COVID-19 and COVID-19 related complications. As a result, out-patient physiotherapy services were interrupted and/or suspended to prioritize in-hospital patient treatment.

5.3.6 Compliance

Another limitation of the study was research study participants not adhering to their specific appointment dates for research conduction. The enrolled participants would be contacted telephonically and reminded via phone call and/or SMS by the principal investigator however, majority of contacted potential participants did not attend to their scheduled appointment dates. The use of telephonic and SMS reminders is often ineffective during periods of load shedding and network interruption, which are common in rural communities. Due to the COVID-19 national government restrictions and principal investigator traveling between five hospital sites on specific allocated days, strict adherence to scheduled appointments was essential. Therefore, when participants deviated from communicated and scheduled appointment dates, this resulted in missed participant enrolments and missed contact sessions.

5.4 Implications for research

This study helps to fill an important gap and contributes to scientific literature on the effects of ULF on physical activity levels as there are no known studies that investigate the effects on overall quality of life of children living in rural Southern Africa, following an upper limb fracture that has been conservatively managed.

The study also highlights the importance of investigating and establishing baseline demographics of children incurring ULF and the point prevalence of ULF of children living in rural South Africa. These are crucial points of interest as they assist health care professionals to best educate patients and guardians towards prevention of injury and associated complications. Additionally, this study highlights the importance of physiotherapy referral and advocates for early physiotherapy intervention for children with low physical functioning in the form of decreased range of motion, decreased strength, decreased physical activity and/or other physical limitations identified by the treating medical practitioner. The findings of the study encourage improved referral pathways of physiotherapy intervention in children with simple ULF. This will contribute towards the holistic medical management of the patient's condition and involvement of all necessary members of the multidisciplinary team.

5.5 Chapter summary

This discussion chapter has comprehensively managed to discuss the interpretation and implications of the research findings, limitations of the study.

CHAPTER 6

6.1 Conclusion

The research study has established baseline demographics of children incurring ULF and the point prevalence of ULF therefore bridging the gap that was present in literature for school-going children living in rural Mpumalanga, South Africa. The findings provided hospital statistics regarding the point prevalence of paediatric simple ULF, types of fractures, cause of injury, place of injury, gender, and age at time of injury. These are crucial points of interest as they assist health care professionals to best educate patients and guardians towards prevention of injury and associated complications.

On the other hand, the study identified a widespread problem of incomplete records and a decline in accurate note keeping by the healthcare providers in public hospitals. Indicating the impact of recording errors and lack of uniformity in hospital patient files and their limiting ability for retrieval of data and exposed incomplete records and a decline in accurate note keeping by the healthcare providers.

The findings of the research study identified a low overall quality of life following an upper limb fracture that has been conservatively managed, particularly for physical functioning and emotional functioning. The research established the effects of simple ULF on health-related quality of life and the impact activities of daily life and play in children to advocate for early physiotherapy intervention for children with low physical functioning in the form of decreased range of motion, decreased strength and/or decreased physical activity. Also, the study's findings indicated a need to improve physiotherapy screening and the referral pathways of physiotherapy intervention in children with simple ULF presenting with low physical functioning. This will contribute towards the holistic medical management of the patient’s condition and involvement of all necessary members of the multidisciplinary team.

6.2 Recommendations

- Due to the assessment of participants at multiple data collection sites, it is recommended that research assistants should be recruited for placement at each hospital. This will accommodate assessment of participants who arrive at the hospitals on an ad hock basis, outside of their scheduled appointments.

- The recording of patient clinical notes among the health care professionals at the hospitals has a lack of uniformity, resulting in difficult information retrieval. Hence, it is recommended that hospitals should encourage regular workshops and training to improve the recording of clinical notes.
- The PedsQL is an effective outcome tool that can be used by various members of the medical multidisciplinary team. It is suggested that health care professionals are trained to use the tool to encourage effective referral of patients to relevant members of the multidisciplinary team, such as referring patients with a low PedsQL physical function score for physiotherapy rehabilitation and those with a low emotional functioning score for psychology.
- Many patient hospital files stored in the departmental statistical records are misplaced due to being stored in open and accessible cupboards. It is recommended that hospitals conduct regular audits to ensure patient hospital files are stored systematically in locked cupboards with secure access control.
- Due to the Covid-19 pandemic, national government restrictions were enforced, and rehabilitation services were suspended to prioritize acute illnesses. As a result, out-patient physiotherapy services were interrupted. Therefore, it is recommended that hospitals re-advertise available services and educate the community on the importance of attendance of physical rehabilitation.

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Appendices

Appendix 1- Participant Information Sheet

STUDY INFORMATION DOCUMENT

Study title: The point prevalence of pediatric upper limb fractures and their effect on the quality of life of children in rural Mpumalanga, South Africa

Introduction:

Greetings,

I, Miss Panashe Furusa, am a Master of Science in Physiotherapy student at the University of the Witwatersrand.

I am researching the commonness of arm fractures (injury causing broken bones) of children in rural South Africa and how it affects children's experience of life. This research will be used to seek new knowledge. This is a study will be for research purposes.

Participants will have their height and weight measured and recorded on the day of their assessment. The PedsQL, a questionnaire to assess the experience of life will be used by the investigating physiotherapist. PedsQL questionnaire will be explained to guardians and children beforehand.

Furthermore, participants will be rescheduled for re-assessment after six (6) weeks and a follow-up assessment will be administered using the PedsQL. However, scheduled research participation dates will be scheduled to coincide with routine physiotherapy appointments to avoid inconvenience.

Invitation to Participate: We are inviting your child to take part in a research study and asking for your permission to include your child in a research study.

The participants have been selected according to these criteria:

- Children of school-going age with ULF
- Children with no previous history of upper limb and/or lower limb fractures
- Children medically treated with immobilization casts.
- Children aged five to 18 years old.

Risks of being involved in the study: None.

Benefits of being in the study: No direct benefits for your child. The results of the project will be available if you are interested in finding out more. Taking part in the project is by choice and saying no will not lead to any loss of benefits or consequences. The project will be explained to your child, and they will be asked to sign another form if they want to take part.

The Participant will be given information on the study while involved in the project and after the results are available.

Participation is voluntary (by choice), refusing to participate will not cause penalty or loss of benefits. For example, a hospital patient; that the Participant may stop participation at any time without penalty, or loss of benefits to which the Participant is otherwise entitled. There is no requirement to provide a reason for withdrawing and

any data collected on such a person will in default be destroyed, unless the Participant specifically consents to its retention.

Reimbursements for "out of pocket" expenses will be covered for transportation for the initial assessment at R30.00 per return-trip for the participant and R30.00 per return-trip for the guardian. A light refreshment will be served during the initial and follow-up assessment. Time involved will be the predominant cost, but there will be no further payment or cost associated with participation as scheduled research participation follow-up dates will be scheduled to coincide with routine physiotherapy appointments.

Confidentiality: Personal information will be treated in the strictest confidence and will only be available to the Principal Investigator and her supervisor if the principal investigator is a postgraduate student. The only exceptions - and all of them are rare - would normally be:

1. personal information may be disclosed if required by law.
2. the Human Research Ethics Committees of the University may exceptionally require personal data to respond to a formal complaint, or for a compliance audit.

All data collected during the study will be securely kept for two (2) years if a scientific publication arises from the study and six (6) years if there is no publication. Thereafter it will be destroyed accordingly.
If results are published, this may, exceptionally, lead to additional research cohort, or more rarely, individual identification.

Anonymity will be through numerical participant numbers used for identification, not through personal information identifiers.

Contact details of researcher/s:

- Panashe Furusa (Principal Investigator)

Telephone: +27796588104
E-mail: nashefurusa@gmail.com

- Dr Natalie Benjamin-Damons (Supervisor)

Email: natalie.benjamin-damons@wits.ac.za

This study has been approved by the Human Research Ethics Committee (Medical) of the University of the Witwatersrand, Johannesburg ("Committee"). A principal function of this Committee is to safeguard the rights and dignity of all human subjects who agree to participate in a research project and the integrity of the research.
If you have any concern over the way the study is being conducted, please contact the Chairperson of this Committee who is Professor Clement Penny, who may be contacted on telephone number 011 717 2301, or by e-mail on Clement.Penny@wits.ac.za. The telephone numbers for the Committee secretariat are 011 717 2700/1234 and the e-mail addresses are Zanele.Ndlovu@wits.ac.za and Rhulani.Mukansi@wits.ac.za

Thank you for reading this Study Information Sheet.

Date: August 2022

Appendix 2: Consent Form & Assent Form



CONSENT SHEET

The point prevalence of paediatric upper limb fractures and their effect on the quality of life of children in rural Mpumalanga, South Africa

1. I have been given a Participant Information Sheet which explains the nature and processes involved in this study, which is attached hereto.
2. I was given time to read it, or had it read to me, and translated in the language I best understand.
3. I was given time to ask any questions I wanted to and found any answers given to me to be reasonable and satisfactory.
4. I believe I fully understand why the study is being conducted and what the intended outcomes will be.
5. I understand that there will be no immediate benefit to me, should I agree to participate, nor will I receive any payment. However, re-imbursement will be given for transportation for the initial assessment. A light refreshment will be served during the initial and follow-up assessment. Time involved will be the predominant cost, but there will be no further payment or cost associated with participation as scheduled research participation follow-up dates will be scheduled to coincide with routine physiotherapy appointments.
6. I understand that, even if I initially consent to take part in the study, I may withdraw at any time and would not be required to give any reasons; if that happened, any data collected about me for the purposes of the study would immediately be destroyed, unless I give consent for it to be retained.
7. I have been given a range of contact details, listed below. If I require further information or become concerned about any aspect of this study, I am free to speak to any of these contacts.

Contact details:

- Panashe Furusa (Principal Investigator)

Telephone: +27796588104

E-mail: nashefurusa@gmail.com

- Dr Natalie Benjamin-Damons (Supervisor)

Email: natalie.benjamin-damons@wits.ac.za

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

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

Name: _____

Name of Participant: _____

Relationship to Participant: _____

Date: _____

Place: _____

Signature _____

Witnessed by:

Name of Witness: _____

Signature: _____

Date: _____

ASSENT FORM FOR MINORS

TITLE OF THE RESEARCH PROJECT: The point prevalence of paediatric upper limb fractures and their effect on the quality of life of children in rural Mpumalanga, South Africa

PRINCIPAL INVESTIGATOR'S NAME(S):

Ms Panashe Furusa, and Dr Natalie Benjamin-Damons (Supervisor)

RESEARCHER'S CONTACT NUMBER:

Panashe Furusa (Principal Investigator)
Telephone: +27796588104
E-mail: nashefurusa@gmail.com

Dr Natalie Benjamin-Damons (Supervisor)
Email: natalie.benjamin-damons@wits.ac.za

Professor CB Penny, Chairperson of the Human Research Ethics Committee (Medical) at the University of Witwatersrand, on telephone no. 011 717 2301, or by e-mail at Clement.Penny@wits.ac.za.
Ms Z Ndlovu or Mr Rhulani Mkansi, Committee Secretariat, telephone numbers: 011 717 2700 or 1234, or by e-mail at: Zanele.Ndlovu@wits.ac.za or Rhulani.Mkansi@wits.ac.za

What is RESEARCH*?*

Research is something we do find **NEW KNOWLEDGE** about the way things (and people) work. We use research projects or studies to help us find out more about children and teenagers and the things that affect their lives, their schools, their families, and their health. We do this to try and make the world a better place!

What is this research project all about?

The commonness of arm fractures of children in rural South Africa and how it affects children's experience of life.

Why have I been invited to take part in this research project?

You are a child with an injured arm, treated with a cast, with no previous injuries and aged between five (5) to 18 years old. Therefore, you can contribute to the research.

Who is doing the research?

Ms Panashe Furusa, a Master of Science in Physiotherapy student at the University of the Witwatersrand with the guidance of Dr Natalie Benjamin-Damons

What will happen to me in this study?

The child will have height and weight taken and recorded on the day of assessment. The child will have to answer a short questionnaire called the PedsQL. The questionnaire will be explained to both guardian and child. After 6 weeks, the child will answer the questionnaire for a second time.

Can anything bad happen to me?

No, there are no possible risks to the child.

Can anything good happen to me?

No direct benefits, the results of the project will be available if you are interested in finding out more about the research.

Will anyone know I am in the study?

The child's participation in the study will be kept confidential, but information about him/her will be given to the supervisor.

Who can I talk to about the study?

Panashe Furusa (Principal Investigator)
Telephone: +27796588104
E-mail: nashefurusa@gmail.com
Dr Natalie Benjamin-Damons (Supervisor)
Email: natalie.benjamin-damons@wits.ac.za

Professor CB Penny, Chairperson of the Human Research Ethics Committee (Medical) at the University of Witwatersrand, on telephone no. 011 717 2301, or by e-mail at Clement.Penny@wits.ac.za. Ms Z Ndlovu or Mr Rhulani Mkansi,

Committee Secretariat, telephone numbers: 011 717 2700 or 1234, or by e-mail at: Zanele.Ndlovu@wits.ac.za or Rhulani.Mkansi@wits.ac.za

What if I do not want to do this?

The child can refuse to take part even if their parents have agreed to their participation. They can stop being in the study at any time without getting in trouble.

Do you understand this research study and are you willing to take part in it?

YES NO

Has the researcher answered all your questions?

YES NO

Do you understand that you can STOP being in the study at any time?

YES NO

_____ _____

Signature of Child Date

Witnessed by:

Name of Witness: _____

Signature: _____

Date: _____

Appendix 3 – Data Collection Part B

Table 6: Data Collection

Participant No.			
Participant's Consent		Date of initial assessment:	
Gender	M F	Age	_____years _____months
Height		Weight BMI	_____ kg _____kg/m^2
PedsQL Score	Date:	Date:	Date:
Other comments			

Appendix 4A - PedsQL Administration Guidelines (Pedsql.org, 2021)

PedsQL™ Administration Guidelines SM

The following guidelines are intended for use by individuals trained in the administration of standardized questionnaires. The PedsQL™ administrator is crucial in developing rapport with the respondents, emphasizing the importance of the questionnaire, addressing concerns, and ensuring that the PedsQL™ is completed accurately and confidentially.

General Protocol

1. Create a procedure for assigning identification numbers that will allow for parent/child comparisons as well as comparisons of baseline/follow-up data.
2. If feasible, the PedsQL™ should be completed *before* the respondents complete any other health data forms and *before* they see their physician or healthcare provider.
3. The parent/child should first complete the PedsQL™ Generic Core Scales and then complete any additional PedsQL™ Module.
4. Parents, Children (8-12) and Teens (13-18) may self-administer the PedsQL™ after introductory instructions from the administrator. If the administrator determines that the child or teen is unable to self-administer the PedsQL (e.g., due to illness, fatigue, reading difficulties), the PedsQL should be read aloud to the child or teen. For the Young Child (5-7), the PedsQL™ should be administered by reading the instructions and each item to the young child word for word. At the beginning of each subscale repeat the recall interval instructions (one month or 7 days) to remind the young child to respond only for that specific recall interval. Use the separate page with the three faces response choices to help the young child understand how to answer. When reading items aloud to a child, intonation should be kept neutral to avoid suggesting an answer.
5. If a child has difficulty understanding the age appropriate PedsQL, the preceding age group version may be administered to the child (e.g., administering the Young Child (5-7) Self-Report version with the three faces response choices to an 8-year-old). However, if a child presents with severe cognitive impairment (as determined by the administrator), the PedsQL may not

be appropriate for that child. In such cases, only the parent–proxy report should be administered to the child's parent.

6. Parents and children were required to complete the questionnaires *independently* of one another. Discourage the parent, child, or other family members from consulting one another during completion of the questionnaire. Let them know that they can feel free to discuss their answers following completion of the questionnaires, but that it is important to obtain both the parents' and children's *individual* perspectives. If you are administering the questionnaire to a child, the child should be facing away from the parent.
7. If the child or parent has a question about what an item means or how they should answer it, do not interpret the question for them. Repeat the item to them verbatim. Ask them to answer the item according to what *they think the question means*. If they have trouble deciding on an answer, ask them to choose the response that comes closest to how they feel. The child and/or the parent has the option of not answering a question if they truly do not understand the question.
8. If a parent/child asks you to interpret the responses, tell her/him that you are not trained to interpret or provide a score for the answers given. If the PedsQL™ is being used for a clinical study, let the parent/child know that their answers will be combined with other participants' answers and analysed as a group rather than as individual respondents.
9. Document all reasons for refusals and non-completions of the PedsQL™.

Administering the PedsQL™

1. The following scripts have been developed as a guide to introduce the PedsQL™ to the child and his/her parent(s). Modify the language to a style that is most appropriate for you and the respondent.

   For the child:

   The PedsQL™ asks you questions about how you feel and what you think about your health. It is not a test, and there are no right or wrong answers. It takes about 5 minutes to complete. If you have any questions, please let me know.

For the parent

The PedsQL™ is a questionnaire that assesses health-related quality of life in children and adolescents. It contains questions about your child's physical, emotional, social, and school functioning in the past one month (or for the Acute version, in the past 7 days).

The PedsQL™ is brief and typically takes less than 5 minutes to complete. It is not a test, and there are no right or wrong answers. Please be sure to read the instructions carefully and choose the response that is closest to how you truly feel. Please do not compare your answers with your child's responses. We are interested in your and your child's individual perspectives. However, feel free to discuss the questionnaire with your child after you have both completed it and returned it to me. If you have any questions, please let me know.

2. Provide the respondent with a pen or pencil and a solid writing surface. If a table is not available, the participant should be provided with an item such as a clipboard. Remain nearby should questions or concerns arise.
3. When the parent/child returns the PedsQL™, look it over and check to see that all answers have been completed. Verify that no item has more than one response. If any responses are incomplete, illegible, or there are multiple responses for an item, please ask the parent or child to indicate their response.
4. Ask the participants if they had any difficulties completing the questionnaire or if they have any other comments regarding the questionnaire. Document any important feedback.
5. Thank the parent and child for taking the time to complete the questionnaire. If the study design involves following up with these respondents, let them know that they may be asked to complete the PedsQL™ again at another time. Indicate when they can expect to be contacted again if known.

Appendix 4B: PedsQL Scoring Guidelines and Questionnaire (Pedsql.org, 2021)

CHILD and PARENT Reports for Young Children (ages 5-7), Children (ages 8-12), Teens (ages 13-18)

The **Child and Parent Reports** of the PedsQL™ 4.0 Generic Core Scales for:

- Young Children (ages 5-7),
- Children (ages 8-12),
- And Teens (ages 13-18),

are composed of 23 items comprising 4 dimensions.

DESCRIPTION OF THE QUESTIONNAIRE:

Dimensions	Number of Items	Cluster of Items	Reversed scoring	Direction of Dimensions
Physical Functioning	8	1-8	1-8	Higher scores indicate better HRQOL.
Emotional Functioning	5	1-5	1-5	
Social Functioning	5	1-5	1-5	
School Functioning	5	1-5	1-5	

SCORING OF DIMENSIONS:

Item Scaling	5-point Likert scale from 0 (Never) to 4 (Almost always) 3-point scale: 0 (Not at all), 2 (Sometimes) and 4 (A lot) for the Young Child (ages 5-7) child report
Weighting of Items	No
Extension of the Scoring Scale	Scores are transformed on a scale from 0 to 100.
Scoring Procedure	**Step 1: Transform Score** Items are reversed scored and linearly transformed to a 0-100 scale as follows: 0=100, 1=75, 2=50, 3=25, 4=0. **Step 2: Calculate Scores** Score by Dimensions: • If more than 50% of the items in the scale are missing, the scale scores should not be computed, • Mean score = Sum of the items over the number of items answered. Psychosocial Health Summary Score = Sum of the items over the number of items answered in the Emotional, Social, and School Functioning Scales. Physical Health Summary Score = Physical Functioning Scale Score Total Score: Sum of all the items over the number of items answered on all the Scales.
Interpretation and Analysis of Missing Data	If more than 50% of the items in the scale are missing, the Scale Scores should not be computed. If 50% or more items are completed: Impute the mean of the completed items in a scale.

Appendix 5A: PedsQL Child Self-Report Questionnaire and PedsQL Parents Proxy-Report Questionnaire (English)

Study ID no._____

Date:_____

PedsQL™

Paediatric Quality of Life Inventory

Version 4.0 - English (South Africa)

TEENAGER REPORT (ages **13-18**)

INSTRUCTIONS

On the following page is a list of things that might be a problem for you. Please tell us **how much of a problem** each one has been for you during the **past ONE month** by circling:

0 if it is **never** a problem
1 if it is **almost never** a problem
2 if it is **sometimes** a problem
3 if it is **often** a problem
4 if it is **almost always** a problem

There are no right or wrong answers.
If you do not understand a question, please ask for help.

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01/00
PedsQL-4.0-Core-A - South Africa/English - Version of 14 May 14 -Mapi.
ID7106 / PedsQL-4.0-Core-A-AU4.0_eng-ZA.doc

*During the past **ONE month**, how much of a **problem** has this been for you...*

ABOUT MY HEALTH AND ACTIVITIES ***(problems with…)***	**Never**	**Almost Never**	**Some-times**	**Often**	**Almost Always**
1. It is hard for me to walk more than 100 metres	0	1	2	3	4
2. It is hard for me to run	0	1	2	3	4
3. It is hard for me to participate in sports activity or exercise	0	1	2	3	4
4. It is hard for me to lift something heavy	0	1	2	3	4
5. It is hard for me to have a bath or shower by myself	0	1	2	3	4
6. It is hard for me to do chores around the house	0	1	2	3	4
7. I have pain or aches	0	1	2	3	4
8. I have low energy levels	0	1	2	3	4

ABOUT MY FEELINGS ***(problems with…)***	**Never**	**Almost Never**	**Some-times**	**Often**	**Almost Always**
1. I feel afraid or scared	0	1	2	3	4
2. I feel sad	0	1	2	3	4
3. I feel angry	0	1	2	3	4
4. I have trouble sleeping	0	1	2	3	4
5. I worry about what will happen to me	0	1	2	3	4

HOW I GET ALONG WITH OTHERS ***(problems with…)***	**Never**	**Almost Never**	**Some-times**	**Often**	**Almost Always**
1. I have trouble getting along with other teenagers	0	1	2	3	4
2. Other teenagers do not want to be my friend	0	1	2	3	4
3. Other teenagers tease me	0	1	2	3	4
4. I cannot do things that other teenagers my age can do	0	1	2	3	4
5. It is hard to keep up with my peers	0	1	2	3	4

ABOUT SCHOOL ***(problems with…)***	**Never**	**Almost Never**	**Some-times**	**Often**	**Almost Always**
1. It is hard to pay attention in class	0	1	2	3	4
2. I forget things	0	1	2	3	4
3. I have trouble keeping up with my schoolwork	0	1	2	3	4
4. I miss school because of not feeling well	0	1	2	3	4
5. I miss school to go to the doctor or hospital	0	1	2	3	4

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Study ID no._____

Date:_____

PedsQL™

Pediatric Quality of Life Inventory

Version 4.0 - English (South Africa)

PARENT REPORT for **TEENAGERS** (ages **13-18**)

DIRECTIONS

On the following page is a list of things that might be a problem for **your teenager**.
Please tell us **how much of a problem** each one has been for **your teenager** during the **past ONE month** by circling:

0 if it is **never** a problem
1 if it is **almost never** a problem
2 if it is **sometimes** a problem
3 if it is **often** a problem
4 if it is **almost always** a problem

There are no right or wrong answers.
If you do not understand a question, please ask for help.

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*During the past **ONE month**, how much of a **problem** has your teenager had with …*

PHYSICAL FUNCTIONING *(problems with…)*	Never	Almost Never	Some-times	Often	Almost Always
1. Walking more than 100 metres	0	1	2	3	4
2. Running	0	1	2	3	4
3. Participating in sports activities or exercise	0	1	2	3	4
4. Lifting something heavy	0	1	2	3	4
5. Having a bath or shower by him or herself	0	1	2	3	4
6. Doing chores around the house	0	1	2	3	4
7. Having pain or aches	0	1	2	3	4
8. Low energy level	0	1	2	3	4

EMOTIONAL FUNCTIONING *(problems with…)*	Never	Almost Never	Some-times	Often	Almost Always
1. Feeling afraid or scared	0	1	2	3	4
2. Feeling sad or down	0	1	2	3	4
3. Feeling angry	0	1	2	3	4
4. Trouble sleeping	0	1	2	3	4
5. Worrying about what will happen to him or her	0	1	2	3	4

SOCIAL FUNCTIONING *(problems with…)*	Never	Almost Never	Some-times	Often	Almost Always
1. Getting along with other teenagers	0	1	2	3	4
2. Other teenagers not wanting to be his or her friend	0	1	2	3	4
3. Getting teased by other teenagers	0	1	2	3	4
4. Not able to do things that other teenagers his or her age can do	0	1	2	3	4
5. Keeping up with other teenagers	0	1	2	3	4

SCHOOL FUNCTIONING *(problems with…)*	Never	Almost Never	Some-times	Often	Almost Always
1. Paying attention in class	0	1	2	3	4
2. Forgetting things	0	1	2	3	4
3. Keeping up with schoolwork	0	1	2	3	4
4. Missing school because of not feeling well	0	1	2	3	4
5. Missing school to go to the doctor or hospital	0	1	2	3	4

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Study ID no._____

Date:_____

PedsQL™

Paediatric Quality of Life Inventory

Version 4.0 - English (South Africa)

CHILD REPORT (ages **8-12**)

INSTRUCTIONS

On the following page is a list of things that might be a problem for you. Please tell us **how much of a problem** each one has been for you during the **past ONE month** by circling:

0 if it is **never** a problem
1 if it is **almost never** a problem
2 if it is **sometimes** a problem
3 if it is **often** a problem
4 if it is **almost always** a problem

There are no right or wrong answers.
If you do not understand a question, please ask for help.

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*During the past **ONE month**, how much of a **problem** has this been for you...*

ABOUT MY HEALTH AND ACTIVITIES ***(problems with…)***	**Never**	**Almost Never**	**Some-times**	**Often**	**Almost Always**
1. It is hard for me to walk more than 100 metres	0	1	2	3	4
2. It is hard for me to run	0	1	2	3	4
3. It is hard for me to participate in sports activity or exercise	0	1	2	3	4
4. It is hard for me to lift something heavy	0	1	2	3	4
5. It is hard for me to have a bath or shower by myself	0	1	2	3	4
6. It is hard for me to do chores around the house	0	1	2	3	4
7. I have pain or aches	0	1	2	3	4
8. I have low energy levels	0	1	2	3	4

ABOUT MY FEELINGS ***(problems with…)***	**Never**	**Almost Never**	**Some-times**	**Often**	**Almost Always**
1. I feel afraid or scared	0	1	2	3	4
2. I feel sad	0	1	2	3	4
3. I feel angry	0	1	2	3	4
4. I have trouble sleeping	0	1	2	3	4
5. I worry about what will happen to me	0	1	2	3	4

HOW I GET ALONG WITH OTHERS ***(problems with…)***	**Never**	**Almost Never**	**Some-times**	**Often**	**Almost Always**
1. I have trouble getting along with other kids	0	1	2	3	4
2. Other kids do not want to be my friend	0	1	2	3	4
3. Other kids tease me	0	1	2	3	4
4. I cannot do things that other kids my age can do	0	1	2	3	4
5. It is hard to keep up when I play with other kids	0	1	2	3	4

ABOUT SCHOOL ***(problems with…)***	**Never**	**Almost Never**	**Some-times**	**Often**	**Almost Always**
1. It is hard to pay attention in class	0	1	2	3	4
2. I forget things	0	1	2	3	4
3. I have trouble keeping up with my schoolwork	0	1	2	3	4
4. I miss school because of not feeling well	0	1	2	3	4
5. I miss school to go to the doctor or hospital	0	1	2	3	4

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Study ID no._____

Date:_____

PedsQL™

Pediatric Quality of Life Inventory

Version 4.0 - English (South Africa)

PARENT REPORT for **CHILDREN** (ages **8-12**)

DIRECTIONS

On the following page is a list of things that might be a problem for **your child**. Please tell us **how much of a problem** each one has been for **your child** during the **past ONE month** by circling:

0 if it is **never** a problem
1 if it is **almost never** a problem
2 if it is **sometimes** a problem
3 if it is **often** a problem
4 if it is **almost always** a problem

There are no right or wrong answers.
If you do not understand a question, please ask for help.

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*During the past **ONE month**, how much of a **problem** has your child had with …*

PHYSICAL FUNCTIONING *(problems with…)*	Never	Almost Never	Some-times	Often	Almost Always
1. Walking more than 100 metres	0	1	2	3	4
2. Running	0	1	2	3	4
3. Participating in sports activities or exercise	0	1	2	3	4
4. Lifting something heavy	0	1	2	3	4
5. Having a bath or shower by him or herself	0	1	2	3	4
6. Doing chores around the house	0	1	2	3	4
7. Having pain or aches	0	1	2	3	4
8. Low energy level	0	1	2	3	4

EMOTIONAL FUNCTIONING *(problems with…)*	Never	Almost Never	Some-times	Often	Almost Always
1. Feeling afraid or scared	0	1	2	3	4
2. Feeling sad or down	0	1	2	3	4
3. Feeling angry	0	1	2	3	4
4. Trouble sleeping	0	1	2	3	4
5. Worrying about what will happen to him or her	0	1	2	3	4

SOCIAL FUNCTIONING *(problems with…)*	Never	Almost Never	Some-times	Often	Almost Always
1. Getting along with other children	0	1	2	3	4
2. Other kids not wanting to be his or her friend	0	1	2	3	4
3. Getting teased by other children	0	1	2	3	4
4. Not able to do things that other children his or her age can do	0	1	2	3	4
5. Keeping up when playing with other children	0	1	2	3	4

SCHOOL FUNCTIONING *(problems with…)*	Never	Almost Never	Some-times	Often	Almost Always
1. Paying attention in class	0	1	2	3	4
2. Forgetting things	0	1	2	3	4
3. Keeping up with schoolwork	0	1	2	3	4
4. Missing school because of not feeling well	0	1	2	3	4
5. Missing school to go to the doctor or hospital	0	1	2	3	4

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Pediatric Quality of Life Inventory

Version 4.0 - English (South Africa)

YOUNG CHILD REPORT (ages **5-7**)

Instructions for interviewer:

I am going to ask you some questions about things that might be a problem for some children. I want to know how much of a problem any of these things might be for you.

Show the child the template and point to the responses as you read.

If it is <u>not at all</u> a problem for you, point to the smiling face

If it is <u>sometimes</u> a problem for you, point to the middle face

If it is a problem for you <u>a lot</u>, point to the frowning face

I will read each question. Point to the pictures to show me how much of a problem it is for you. Let's try a practice one first.

	Not at all	Sometimes	A lot
Is it hard for you to snap your fingers	☺	😐	☹

Ask the child to demonstrate snapping his or her fingers to determine whether or not the question was answered correctly. Repeat the question if the child demonstrates a response that is different from his or her action.

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Think about how you have been doing for the last few weeks. Please listen carefully to each sentence and tell me how much of a problem this is for you.

After reading the item, gesture to the template. If the child hesitates or does not seem to understand how to answer, read the response options while pointing at the faces.

PHYSICAL FUNCTIONING ***(problems with…)***	**Not at all**	**Sometimes**	**A lot**
1. Is it hard for you to walk	0	2	4
2. Is it hard for you to run	0	2	4
3. Is it hard for you to play sports or exercise	0	2	4
4. Is it hard for you to pick up big things	0	2	4
5. Is it hard for you to take a bath or shower	0	2	4
6. Is it hard for you to do chores (like pick up your toys)	0	2	4
7. Do you have pains or aches (***Where?_____***)	0	2	4
8. Do you ever feel too tired to play	0	2	4

Remember, tell me how much of a problem this has been for you for the last few weeks.

EMOTIONAL FUNCTIONING ***(problems with…)***	**Not at all**	**Sometimes**	**A lot**
1. Do you feel scared	0	2	4
2. Do you feel sad	0	2	4
3. Do you feel mad	0	2	4
4. Do you have trouble sleeping	0	2	4
5. Do you worry about what will happen to you	0	2	4

SOCIAL FUNCTIONING ***(problems with…)***	**Not at all**	**Sometimes**	**A lot**
1. Is it hard for you to get along with other kids	0	2	4
2. Do other kids say they do not want to play with you	0	2	4
3. Do other kids tease you	0	2	4
4. Can other kids do things that you cannot do	0	2	4
5. Is it hard for you to keep up when you play with other kids	0	2	4

SCHOOL FUNCTIONING ***(problems with…)***	**Not at all**	**Sometimes**	**A lot**
1. Is it hard for you to pay attention in school	0	2	4
2. Do you forget things	0	2	4
3. Is it hard to keep up with schoolwork	0	2	4
4. Do you miss school because of not feeling well	0	2	4
5. Do you miss school because you have to go to the doctor's or hospital	0	2	4

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How much of a problem is this for you?

Not at all



Sometimes



A lot



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Pediatric Quality of Life Inventory

Version 4.0 - English (South Africa)

PARENT REPORT for **YOUNG CHILDREN** (ages **5-7**)

DIRECTIONS

On the following page is a list of things that might be a problem for **your child**. Please tell us **how much of a problem** each one has been for **your child** during the **past ONE month** by circling:

0 if it is **never** a problem
1 if it is **almost never** a problem
2 if it is **sometimes** a problem
3 if it is **often** a problem
4 if it is **almost always** a problem

There are no right or wrong answers.
If you do not understand a question, please ask for help.

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*During the past **ONE month**, how much of a **problem** has your child had with …*

PHYSICAL FUNCTIONING *(problems with…)*	Never	Almost Never	Some-times	Often	Almost Always
1. Walking more than 100 metres	0	1	2	3	4
2. Running	0	1	2	3	4
3. Participating in sports activities or exercise	0	1	2	3	4
4. Lifting something heavy	0	1	2	3	4
5. Having a bath or shower by him or herself	0	1	2	3	4
6. Doing chores, like picking up his or her toys	0	1	2	3	4
7. Having pain or aches	0	1	2	3	4
8. Low energy level	0	1	2	3	4

EMOTIONAL FUNCTIONING *(problems with…)*	Never	Almost Never	Some-times	Often	Almost Always
1. Feeling afraid or scared	0	1	2	3	4
2. Feeling sad or down	0	1	2	3	4
3. Feeling angry	0	1	2	3	4
4. Trouble sleeping	0	1	2	3	4
5. Worrying about what will happen to him or her	0	1	2	3	4

SOCIAL FUNCTIONING *(problems with…)*	Never	Almost Never	Some-times	Often	Almost Always
1. Getting along with other children	0	1	2	3	4
2. Other kids not wanting to be his or her friend	0	1	2	3	4
3. Getting teased by other children	0	1	2	3	4
4. Not able to do things that other children his or her age can do	0	1	2	3	4
5. Keeping up when playing with other children	0	1	2	3	4

SCHOOL FUNCTIONING *(problems with…)*	Never	Almost Never	Some-times	Often	Almost Always
1. Paying attention in class	0	1	2	3	4
2. Forgetting things	0	1	2	3	4
3. Keeping up with school activities	0	1	2	3	4
4. Missing school because of not feeling well	0	1	2	3	4
5. Missing school to go to the doctor or hospital	0	1	2	3	4

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Date:_____

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Pediatric Quality of Life Inventory

Version 4.0 - English (South Africa)

PARENT REPORT for **TODDLERS** (ages **2-4**)

DIRECTIONS

On the following page is a list of things that might be a problem for **your child**. Please tell us **how much of a problem** each one has been for **your child** during the **past ONE month** by circling:

0 if it is **never** a problem
1 if it is **almost never** a problem
2 if it is **sometimes** a problem
3 if it is **often** a problem
4 if it is **almost always** a problem

There are no right or wrong answers.
If you do not understand a question, please ask for help.

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*During the past **ONE month**, how much of a **problem** has your child had with …*

PHYSICAL FUNCTIONING *(problems with…)*	Never	Almost Never	Some-times	Often	Almost Always
1. Walking	0	1	2	3	4
2. Running	0	1	2	3	4
3. Participating in active play or exercise	0	1	2	3	4
4. Lifting something heavy	0	1	2	3	4
5. Having a bath	0	1	2	3	4
6. Helping to pick up his or her toys	0	1	2	3	4
7. Having pain or aches	0	1	2	3	4
8. Low energy level	0	1	2	3	4

EMOTIONAL FUNCTIONING *(problems with…)*	Never	Almost Never	Some-times	Often	Almost Always
1. Feeling afraid or scared	0	1	2	3	4
2. Feeling sad or down	0	1	2	3	4
3. Feeling angry	0	1	2	3	4
4. Trouble sleeping	0	1	2	3	4
5. Worrying	0	1	2	3	4

SOCIAL FUNCTIONING *(problems with…)*	Never	Almost Never	Some-times	Often	Almost Always
1. Playing with other children	0	1	2	3	4
2. Other kids not wanting to play with him or her	0	1	2	3	4
3. Getting teased by other children	0	1	2	3	4
4. Not able to do things that other children his or her age can do	0	1	2	3	4
5. Keeping up when playing with other children	0	1	2	3	4

***Please complete this section if your child attends school or daycare**

SCHOOL FUNCTIONING *(problems with…)*	Never	Almost Never	Some-times	Often	Almost Always
1. Doing the same school activities as peers	0	1	2	3	4
2. Missing school/daycare because of not feeling well	0	1	2	3	4
3. Missing school/daycare to go to the doctor or hospital	0	1	2	3	4

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Appendix 5B: PedsQL Child Self-Report Questionnaire and PedsQL Parents Proxy-Report Questionnaire (IsiZulu)

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Imibuzo Ngesimo Sezinga Lempilo Yomntwana

Version 4.0 - Zulu (South Africa)

UMBIKO WOMUNTU OSEMUSHA (iminyaka **13-18**)

IZIQONDISO

Ekhasini elilandelayo kunohlu lwezinto ezingase zibe yinkinga kuwena. Sicela usitshele ukuthi **inkinga ngayinye ibe nkulu** kangakanani kuwe esikhathini **esiyinyanga EYODWA edlule** ngokukokolozela:

0 uma **ingakaze nhlobo** ibe yinkinga
1 uma **cishe ingakaze** ibe yinkinga
2 uma **ngezinye izinkathi** iyinkinga
3 uma **ngokuvamile** iyinkinga
4 uma **cishe ngaso sonke isikhathi** iyinkinga

Azikho izimpendulo ezishaya emhlolweni noma ezingashayi emhlolweni. Uma ungawuqondi umbuzo, siza ucele usizo.

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***Enyangeni EYODWA** edlule, **bekuyinkinga** engakanani lokhu kuwe …*

OKUMAYELANA NEMPILO YAMI KANYE NEMISEBENZI ***(izinkinga nge…)***	**Akukaze Nhlobo**	**Cishe Akukaze**	**Ngezinye Izinkathi**	**Kaningi**	**Cishe Njalo Nje**
1. Kunzima kimi ukuhamba ibangana ngedwa	0	1	2	3	4
2. Kunzima kimi ukugijima	0	1	2	3	4
3. Kunzima kimi ukuzibandakanya kwezemidlalo noma ukuvocavoca umzimba	0	1	2	3	4
4. Kunzima kimi ukuphakamisa into esindayo	0	1	2	3	4
5. Kunzima kimi ukugeza kubhavu noma eshaweni	0	1	2	3	4
6. Kunzima kimi ukwenza imisebenzi yasekhaya	0	1	2	3	4
7. Ngizwela ubuhlungu	0	1	2	3	4
8. Nginezinga lamandla eliphansi	0	1	2	3	4

OKUMAYELANA NEMIZWA YAMI ***(izinkinga nge…)***	**Akukaze Nhlobo**	**Cishe Akukaze**	**Ngezinye Izinkathi**	**Kaningi**	**Cishe Njalo Nje**
1. Ngizizwela ngisaba noma ngithuthumele	0	1	2	3	4
2. Ngizizwa ngidabukile noma ngidangele	0	1	2	3	4
3. Ngizizwa ngidiniwe	0	1	2	3	4
4. Nginenkinga yokulala	0	1	2	3	4
5. Ngiyakhathazeka ngokuthi kuzokwenzekani kimi	0	1	2	3	4

INDLELA ENGIZWANA NGAYO NABANYE ***(izinkinga nge…)***	**Akukaze Nhlobo**	**Cishe Akukaze**	**Ngezinye Izinkathi**	**Kaningi**	**Cishe Njalo Nje**
1. Nginenkinga nabanye abantwana abakhulakhulile	0	1	2	3	4
2. Abanye abantwana abakhulakhulile abafuni ukuba abangane bami	0	1	2	3	4
3. Abanye abantwana abakhulakhulile bayangidelela	0	1	2	3	4
4. Angikwazi ukwenza izinto ezenziwa abanye abantwana asebekhulakhulile	0	1	2	3	4
5. Kunzima ukuhambisana nontanga bami	0	1	2	3	4

MAYELANA NESIKOLE ***(izinkinga nge…)***	**Akukaze Nhlobo**	**Cishe Akukaze**	**Ngezinye Izinkathi**	**Kaningi**	**Cishe Njalo Nje**
1. Kunzima ukunaka okwenzekayo ekilasini	0	1	2	3	4
2. Ngiyakhohlwa izinto	0	1	2	3	4
3. Nginenkinga yokusalela emuva emsebenzini wami wesikole	0	1	2	3	4
4. Ngiyalova esikoleni ngoba ngingaphilile	0	1	2	3	4
5. Ngiyalova esikoleni ngoba kufanele ngiye kadokotela noma esibhedlela	0	1	2	3	4

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Uhlu Olumayelana Nezinga Lempilo Ezinganeni

Version 4.0 – Zulu (South Africa)

UMBIKO WOMZALI NGENGANE ESIKHULAKHULILE
(iminyaka eyi-**13 kuya kweyi-18**)

IMIYALELO

Kuleli khasi elilandelayo kunohlu lwezinto ezingaba yinkinga **enganeni yakho.** Sicela usazise ukuthi into ngayinye **ibe inkinga engakanani enganeni yakho enyangeni EYODWA eyedlule** ngokuthi udwebe indingiliza ezungeze u-:

0 uma **kungabi nhlobo** inkinga
1 uma **kucishe kungabi nhlobo** inkinga
2 uma kuba inkinga **kwesinye isikhathi**
3 uma kuba inkinga **esikhathini esiningi**
4 uma **kucishe kube** inkinga **njalo**

Azikho izimpendulo ezilungile noma ezingalungile.
Uma ungawuqondi umbuzo, sicela ucele usizo.

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***Enyangeni EYODWA** eyedlule, ingabe ingane yakho ibe **nenkinga** engakanani ngalokhu:*

OKUPHATHELENE NOKUSEBENZA KOMZIMBA ***(izinkinga ngalokhu:)***	Nhlobo	Cishe Kungabi Nhlobo Inkinga	Kwesinye Isikhathi	Esikhathi-ni Esiningi	Cishe Njalo
1. Ukuhamba ibangana nje elincane (amamitha ayi-100)	0	1	2	3	4
2. Ukugijima	0	1	2	3	4
3. Ukubamba iqhaza kwezemidlalo noma ekuzivocavoceni	0	1	2	3	4
4. Ukuphakamisa into esindayo	0	1	2	3	4
5. Ukuzigeza ebhavini noma eshaweni	0	1	2	3	4
6. Ukwenza imisebenzana yasekhaya	0	1	2	3	4
7. Ukuzwa izinhlungu	0	1	2	3	4
8. Ukuzizwa ikhathele	0	1	2	3	4

OKUPHATHELENE NEZOMPHEFUMULO ***(izinkinga ngalokhu:)***	Nhlobo	Cishe Kungabi Nhlobo Inkinga	Kwesinye Isikhathi	Esikhathi-ni Esiningi	Cishe Njalo
1. Ukuzizwa isaba	0	1	2	3	4
2. Ukuzizwa iphatheke kabi imoyeni	0	1	2	3	4
3. Ukuzizwa icasukile	0	1	2	3	4
4. Ukuba nezinkinga eziphathelene nobuthongo	0	1	2	3	4
5. Ukukhathazeka ngokuthi kuzokwenzekani kuyo	0	1	2	3	4

OKUPHATHELENE NOKUZIBANDAKANYA NABANYE ABANTU ***(izinkinga ngalokhu:)***	Nhlobo	Cishe Kungabi Nhlobo Inkinga	Kwesinye Isikhathi	Esikhathi-ni Esiningi	Cishe Njalo
1. Ukuzwana nontanga yakhe	0	1	2	3	4
2. Ukuthi ontanga yakhe bangafuni ukuba umngani wakhe	0	1	2	3	4
3. Ukuchwenswa ontanga yakhe	0	1	2	3	4
4. Ukungakwazi ukwenza izinto ezenziwa ontanga yakhe	0	1	2	3	4
5. Ukukwazi ukumelana nontanga yakhe uma kudlalwa	0	1	2	3	4

OKUPHATHELENE NESIKOLE ***(izinkinga ngalokhu:)***	Nhlobo	Cishe Kungabi Nhlobo Inkinga	Kwesinye Isikhathi	Esikhathi-ni Esiningi	Cishe Njalo
1. Ukulalela egumbini lokufunda	0	1	2	3	4
2. Ukukhohlwa	0	1	2	3	4
3. Ukukwazi ukumelana nomsebenzi wesikole	0	1	2	3	4
4. Ukuphuthwa isikole ngenxa yokungazizwa kahle	0	1	2	3	4
5. Ukuphuthwa isikole ngenxa yokuya kwadokotela noma esibhedlela	0	1	2	3	4

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Imibuzo Ngesimo Sezinga Lempilo Yomntwana

Version 4.0 - Zulu (South Africa)

UMBIKO WOMNTWANA (iminyaka **8-12**)

IZIQONDISO

Ekhasini elilandelayo kunohlu lwezinto ezingase zibe yinkinga kuwena. Sicela usitshele ukuthi **inkinga ngayinye ibe nkulu** kangakanani kuwe esikhathini **esiyinyanga EYODWA edlule** ngokukokolozela:

0 uma **ingakaze nhlobo** ibe yinkinga
1 uma **cishe ingakaze** ibe yinkinga
2 uma **ngezinye izinkathi** iyinkinga
3 uma **ngokuvamile** iyinkinga
4 uma **cishe ngaso sonke isikhathi** iyinkinga

Azikho izimpendulo ezishaya emhlolweni noma ezingashayi emhlolweni. Uma ungawuqondi umbuzo, siza ucele usizo.

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***Enyangeni EYODWA** edlule, **bekuyinkinga** engakanani lokhu kuwe …*

OKUMAYELANA NEMPILO YAMI KANYE NEMISEBENZI ***(izinkinga nge…)***	**Akukaze Nhlobo**	**Cishe Akukaze**	**Ngezinye Izinkathi**	**Kaningi**	**Cishe Njalo Nje**
1. Kunzima kimi ukuhamba ibangana ngedwa	0	1	2	3	4
2. Kunzima kimi ukugijima	0	1	2	3	4
3. Kunzima kimi ukuzibandakanya kwezemidlalo noma ukuvocavoca umzimba	0	1	2	3	4
4. Kunzima kimi ukuphakamisa into esindayo	0	1	2	3	4
5. Kunzima kimi ukugeza kubhavu noma eshaweni	0	1	2	3	4
6. Kunzima kimi ukwenza imisebenzi yasekhaya	0	1	2	3	4
7. Ngizwela ubuhlungu	0	1	2	3	4
8. Nginezinga lamandla eliphansi	0	1	2	3	4

OKUMAYELANA NEMIZWA YAMI ***(izinkinga nge…)***	**Akukaze Nhlobo**	**Cishe Akukaze**	**Ngezinye Izinkathi**	**Kaningi**	**Cishe Njalo Nje**
1. Ngizizwa ngisaba noma ngithuthumele	0	1	2	3	4
2. Ngizizwa ngidabukile noma ngidangele	0	1	2	3	4
3. Ngizizwa ngidiniwe	0	1	2	3	4
4. Nginenkinga yokulala	0	1	2	3	4
5. Ngiyakhathazeka ngokuthi kuzokwenzekani kimi	0	1	2	3	4

INDLELA ENGIZWANA NGAYO NABANYE ***(izinkinga nge…)***	**Akukaze Nhlobo**	**Cishe Akukaze**	**Ngezinye Izinkathi**	**Kaningi**	**Cishe Njalo Nje**
1. Nginenkinga yokuzwana nezinye izingane	0	1	2	3	4
2. Ezinye izingane azifuni ukuba umngane wami	0	1	2	3	4
3. Ezinye izingane ziyangidelela	0	1	2	3	4
4. Angikwazi ukwenza izinto ezenziwa abantwana abalingana nami	0	1	2	3	4
5. Kunzima ukungasaleli emuva uma ngidlala nezinye izingane	0	1	2	3	4

MAYELANA NESIKOLE ***(izinkinga nge…)***	**Akukaze Nhlobo**	**Cishe Akukaze**	**Ngezinye Izinkathi**	**Kaningi**	**Cishe Njalo Nje**
1. Kunzima ukunaka okwenzekayo ekilasini	0	1	2	3	4
2. Ngiyakhohlwa izinto	0	1	2	3	4
3. Nginenkinga yokungasaleli emuva emsebenzini wami wesikole	0	1	2	3	4
4. Ngiyalova esikoleni ngoba ngingaphilile	0	1	2	3	4
5. Ngiyalova esikoleni ngoba kufanele ngiye kadokotela noma esibhedlela	0	1	2	3	4

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Uhlu Olumayelana Nezinga Lempilo Ezinganeni

Version 4.0 – Zulu (South Africa)

UMBIKO WOMZALI NGENGANE (iminyaka eyi-**8 kuya kweyi-12**)

IMIYALELO

Kuleli khasi elilandelayo kunohlu lwezinto ezingaba yinkinga **enganeni yakho.** Sicela usazise ukuthi into ngayinye **ibe inkinga engakanani enganeni yakho enyangeni EYODWA eyedlule** ngokuthi udwebe indingiliza ezungeze u-:

0 uma **kungabi nhlobo** inkinga
1 uma **kucisha kungabi nhlobo** inkinga
2 uma kuba inkinga **kwesinye isikhathi**
3 uma kuba inkinga **esikhathini esiningi**
4 uma **kucishe kube** inkinga **njalo**

Azikho izimpendulo ezilungile noma ezingalungile.
Uma ungawuqondi umbuzo, sicela ucele usizo.

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***Enyangeni EYODWA** eyedlule, ingabe ingane yakho ibe **nenkinga** engakanani ngalokhu:*

OKUPHATHELENE NOKUSEBENZA KOMZIMBA ***(izinkinga ngalokhu:)***	Nhlobo	Cishe Kungabi Nhlobo Inkinga	Kwesinye Isikhathi	Esikhathi-ni Esiningi	Cishe Njalo
1. Ukuhamba ibangana nje elincane (amamitha ayi-100)	0	1	2	3	4
2. Ukugijima	0	1	2	3	4
3. Ukubamba iqhaza kwezemidlalo noma ekuzivocavoceni	0	1	2	3	4
4. Ukuphakamisa into esindayo	0	1	2	3	4
5. Ukuzigeza ebhavini noma eshaweni	0	1	2	3	4
6. Ukwenza imisebenzana yasekhaya	0	1	2	3	4
7. Ukuzwa izinhlungu	0	1	2	3	4
8. Ukuzizwa ikhathele	0	1	2	3	4

OKUPHATHELENE NEZOMPHEFUMULO ***(izinkinga ngalokhu:)***	Nhlobo	Cishe Kungabi Nhlobo Inkinga	Kwesinye Isikhathi	Esikhathi-ni Esiningi	Cishe Njalo
1. Ukuzizwa isaba	0	1	2	3	4
2. Ukuzizwa iphatheke kabi emoyeni	0	1	2	3	4
3. Ukuzizwa icasukile	0	1	2	3	4
4. Ukuba nezinkinga eziphathelene nobuthongo	0	1	2	3	4
5. Ukukhathazeka ngokuthi kuzokwenzekani kuyo	0	1	2	3	4

OKUPHATHELENE NOKUZIBANDAKANYA NABANYE ABANTU ***(izinkinga ngalokhu:)***	Nhlobo	Cishe Kungabi Nhlobo Inkinga	Kwesinye Isikhathi	Esikhathi-ni Esiningi	Cishe Njalo
1. Ukuzwana nezinye izingane	0	1	2	3	4
2. Ukuthi ezinye izingane zingafuni ukuba umngani wakhe	0	1	2	3	4
3. Ukuchwenswa ngezinye izingane	0	1	2	3	4
4. Ukungakwazi ukwenza izinto ezenziwa ezinye izingane ezilingana naye	0	1	2	3	4
5. Ukukwazi ukumelana nezinye izingane uma kudlalwa	0	1	2	3	4

OKUPHATHELENE NESIKOLE ***(izinkinga ngalokhu:)***	Nhlobo	Cishe Kungabi Nhlobo Inkinga	Kwesinye Isikhathi	Esikhathi-ni Esiningi	Cishe Njalo
1. Ukulalela egumbini lokufunda	0	1	2	3	4
2. Ukukhohlwa	0	1	2	3	4
3. Ukukwazi ukumelana nomsebenzi wesikole	0	1	2	3	4
4. Ukuphuthwa isikole ngenxa yokungazizwa kahle	0	1	2	3	4
5. Ukuphuthwa isikole ngenxa yokuya kwadokotela noma esibhedlela	0	1	2	3	4

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Imibuzo Ngesimo Sezinga Lempilo Yomntwana

Version 4.0 - Zulu (South Africa)

UMBIKO WOMNTWANA OSEMNCANE (iminyaka **5-7**)

Imiyalelo yobuza imibuzo:

Ngizokubuza imibuzo ngezinto ezingase zibe yinkinga kwezinye izingane. Ngifuna ukwazi ukuthi ngabe lezinto zingaba inkinga engakanani kuwena.

Khombisa umntwana ithempulethi bese ukhombe izimpendulo ngesikhathi usafunda.

Uma kungenzekanga nakancane nkinga kuwena, khomba ubuso obumoyizelayo

Uma ngezinye izinkathi kuba yinkinga kuwena, khomba ubuso obumaphakathi

Uma kuyinkinga kuwena kangakanani khomba ubuso obunyukubele

Ngizofunda umbuzo ngamunye. Khomba izithombe ukuze uveze ukuthi ngabe kuyinkinga kangakanani kuwena. Asiqale sikhombisane ngokuzama kuqala.

	Akwenze-kanga nakancane	Ngezinye Izinkathi	Kaningana
Kunzima kuwena ukwenza umsindo ngezandla	☺	😐	☹

Cela umntwana akwenzele umsindo ngezandla zakhe ukuze ubone ukuthi umbuzo uphendulwe ngendlela na. Phinda umbuzo uma umntwana ekhombisa impendulo ehlukile kunezenzo zakhe.

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Cabanga ngokuthi bewuqhuba kanjani emavikini ambalwa adlule. Sicela ulalelisise umbuzo ngamunye bese ungitshele ukuthi ngabe kuyinkinga engakanani kuwena.

Emuva kokufunda utho, khomba kuthempulethi. Uma umntwana engabaza noma kungathi akaqondi ukuthi aphendule kanjani, funda izimpendulo angakhetha kuzo ube ukhomba ubuso.

UKUSEBENZA KOMZIMBA ***(izinkinga nge…)***	**Akwenze-kanga nakancane**	**Ngezinye izinkathi**	**Kaningana**
1. Ngabe kuwena kunzima ukuhamba	0	2	4
2. Ngabe kuwena kunzimba ukugijima	0	2	4
3. Ngabe kunzima ukudlala imidlalo noma ukuzivocavoca	0	2	4
4. Ngabe kunzima ukucosha izinto ezisindayo	0	2	4
5. Ngabe kunzima ukugeza endishini noma eshaweni	0	2	4
6. Ngabe kuwena kunzima ukwenza imisebenzi (njengokucosha amathoyizi akho)	0	2	4
7. Ngabe uzwela ubuhlungu (***Kuphi?***_____)	0	2	4
8. Ngabe uzizwela ukhathele kakhulu ukuthi ungadlala	0	2	4

Khumbula, ungitshele ukuthi lokhu kube yinkinga engakanani emavikini ambalwa adlule.

OKUMAYELANA NEMIZWA ***(izinkinga nge…)***	**Akwenze-kanga nakancane**	**Ngezinye izinkathi**	**Kaningana**
1. Ngabe uzizwela wesaba	0	2	4
2. Ngabe uzizwela udangele	0	2	4
3. Ngabe uzizwela ucasukile	0	2	4
4. Ngabe unenkinga yokulala	0	2	4
5. Ngabe uyakhathazeka ngokuthi kuzokwenzekani kuwe	0	2	4

UKUSEBENZISANA NABANTU ***(izinkinga nge…)***	**Akwenze-kanga nakancane**	**Ngezinye izinkathi**	**Kaningana**
1. Kunzima kuwe ukuzwana nezinye izingane	0	2	4
2. Ngabe ezinye izingane zithi azifuni ukudlala nawe	0	2	4
3. Ngabe ezinye izingane ziyakudelela	0	2	4
4. Ngabe ezinye izingane ziyakwazi ukwenza izinto wena ongakwazi ukuzenza	0	2	4
5. Ngabe kunzima kuwena ukuhambisana nezinye izingane uma kudlalwa	0	2	4

MAYELANA NESIKOLE ***(izinkinga nge…)***	**Akwenze-kanga nakancane**	**Ngezinye izinkathi**	**Kaningana**
1. Ngabe kunzima kuwena ukunaka okwenziwayo esikoleni	0	2	4
2. Ngabe uyakhohlwa izinto	0	2	4
3. Ngabe kunzima ukungasali emsebenzini wesikole	0	2	4
4. Ngabe uyalova esikoleni ngoba ungaphilile kahle	0	2	4
5. Ngabe uyalova esikoleni ngoba kufanele uye kudokotela noma esibhedlela	0	2	4

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Ngabe lokhu kuyinkinga kangakanani kuwe?

Akwenzekanga nakancane	Ngezinye Izinkathi	Kaningana
		

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Uhlu Olumayelana Nezinga Lempilo Ezinganeni

Version 4.0 – Zulu (South Africa)

UMBIKO WOMZALI NGENGANE ESENCANE (iminyaka eyi-**5 kuya kweyi-7**)

IMIYALELO

Kuleli khasi elilandelayo kunohlu lwezinto ezingaba yinkinga **enganeni yakho.** Sicela usazise ukuthi into ngayinye **ibe inkinga engakanani enganeni yakho enyangeni EYODWA eyedlule** ngokuthi udwebe indingiliza ezungeze u-:

0 uma **kungabi nhlobo** inkinga
1 uma **kucishe kungabi nhlobo** inkinga
2 uma kuba inkinga **kwesinye isikhathi**
3 uma kuba inkinga **esikhathini esiningi**
4 uma **kucishe kube** inkinga **njalo**

Azikho izimpendulo ezilungile noma ezingalungile.
Uma ungawuqondi umbuzo, sicela ucele usizo.

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***Enyangeni EYODWA** eyedlule, ingabe ingane yakho ibe **nenkinga** engakanani ngalokhu:*

OKUPHATHELENE NOKUSEBENZA KOMZIMBA ***(izinkinga ngalokhu:)***	Nhlobo	Cishe Kungabi Nhlobo Inkinga	Kwesinye Isikhathi	Esikhathi-ni Esiningi	Cishe Njalo
1. Ukuhamba ibangana nje elincane (amamitha ayi-100)	0	1	2	3	4
2. Ukugijima	0	1	2	3	4
3. Ukubamba iqhaza kwezemidlalo noma ekuzivocavoceni	0	1	2	3	4
4. Ukuphakamisa into esindayo	0	1	2	3	4
5. Ukuzigeza ebhavini noma eshaweni	0	1	2	3	4
6. Ukwenza imisebenzana yasekhaya njengokucosha amathoyizi phansi	0	1	2	3	4
7. Ukuzwa izinhlungu	0	1	2	3	4
8. Ukuzizwa ikhathele	0	1	2	3	4

OKUPHATHELENE NEZOMPHEFUMULO ***(izinkinga ngalokhu:)***	Nhlobo	Cishe Kungabi Nhlobo Inkinga	Kwesinye Isikhathi	Esikhathi-ni Esiningi	Cishe Njalo
1. Ukuzizwa isaba	0	1	2	3	4
2. Ukuzizwa iphatheke kabi emoyeni	0	1	2	3	4
3. Ukuzizwa icasukile	0	1	2	3	4
4. Ukuba nezinkinga eziphathelene nobuthongo	0	1	2	3	4
5. Ukukhathazeka ngokuthi kuzokwenzekani kuyo	0	1	2	3	4

OKUPHATHELENE NOKUZIBANDAKANYA NABANYE ABANTU ***(izinkinga ngalokhu:)***	Nhlobo	Cishe Kungabi Nhlobo Inkinga	Kwesinye Isikhathi	Esikhathi-ni Esiningi	Cishe Njalo
1. Ukuzwana nezinye izingane	0	1	2	3	4
2. Ukuthi ezinye izingane zingafuni ukuba umngani wakhe	0	1	2	3	4
3. Ukuchwenswa ezinye izingane	0	1	2	3	4
4. Ukungakwazi ukwenza izinto ezenziwa ezinye izingane ezilingana naye	0	1	2	3	4
5. Ukukwazi ukumelana nezinye izingane uma kudlalwa	0	1	2	3	4

OKUPHATHELENE NESIKOLE ***(izinkinga ngalokhu:)***	Nhlobo	Cishe Kungabi Nhlobo Inkinga	Kwesinye Isikhathi	Esikhathi-ni Esiningi	Cishe Njalo
1. Ukulalela egumbini lokufunda	0	1	2	3	4
2. Ukukhohlwa	0	1	2	3	4
3. Ukukwazi ukumelana nomsebenzi wesikole	0	1	2	3	4
4. Ukuphuthwa isikole ngenxa yokungazizwa kahle	0	1	2	3	4
5. Ukuphuthwa isikole ngenxa yokuya kwadokotela noma esibhedlela	0	1	2	3	4

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Imibuzo Ngesimo Sezinga Lempilo Yomntwana

Version 4.0 - Zulu (South Africa)

UMBIKO WOMZALI WABANTWANA (iminyaka **2-4**)

IZIQONDISO

Ekhasini elilandelayo kunohlu lwezinto ezingase zibe yinkinga **ngomntanakho**. Sicela usitshele ukuthi **inkinga ngayinye ibe nkulu** kangakanani **ngomntanakho** enyangeni **EYODWA edlule** ngokukokolozela:

0 uma **ingakaze nhlobo** ibe yinkinga
1 uma **cishe ingakaze** ibe yinkinga
2 uma **ngezinye izinkathi** yinkinga
3 uma **ngokuvamile** iyinkinga
4 uma **cishe ngaso sonke isikhathi** iyinkinga

Azikho izimpendulo ezishaya emhlolweni noma ezingashayi emhlolweni. Uma ungawuqondi umbuzo, siza ucele usizo.

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*Enyangeni **EYODWA edlule** umntanakho,ube nenkinga **engakanani** ngalokhu…*

UKUSEBENZA KOMZIMBA *(izinkinga nge…)*	Akukaze Nhlobo	Cishe Akukaze	Ngezinye izinkathi	Kaningi	Cishe Njalo Nje
1. Ukuhamba	0	1	2	3	4
2. Ukugijima	0	1	2	3	4
3. Ukuzibandakanya emidlalweni noma ukuzivocavoca	0	1	2	3	4
4. Ukuphakamisa into esindayo	0	1	2	3	4
5. Ukugeza	0	1	2	3	4
6. Ukusiza ekucoshweni kwamathoyizi akhe	0	1	2	3	4
7. Uzwela ubuhlungu	0	1	2	3	4
8. Amazinga amandla aphansi	0	1	2	3	4

OKUMAYELANA NEMIZWA *(izinkinga nge…)*	Akukaze Nhlobo	Cishe Akukaze	Ngezinye izinkathi	Kaningi	Cishe Njalo Nje
1. Uzizwela esaba noma ethuthumele	0	1	2	3	4
2. Uzizwela ekhathazekile	0	1	2	3	4
3. Uzizwela ecasukile	0	1	2	3	4
4. Unenkinga yokulala	0	1	2	3	4
5. Uyakhathazeka	0	1	2	3	4

UKUSEBENZISANA NABANTU *(izinkinga nge…)*	Akukaze Nhlobo	Cishe Akukaze	Ngezinye izinkathi	Kaningi	Cishe Njalo Nje
1. Ukudlala nezinye izingane	0	1	2	3	4
2. Ezinye izingane azifuni ukudlala naye	0	1	2	3	4
3. Uyadelelwa ezinye izingane	0	1	2	3	4
4. Akakwazi ukwenza izinto ezenziwa abanye abantwana abangangaye	0	1	2	3	4
5. Uyakwazi ukuhambisana nezinye izingane uma kudlalwa	0	1	2	3	4

Sicela ugcwalise lesi gaba uma umntawana wakho efunda esikoleni noma enkulisa

MAYELANA NESIKOLE *(izinkinga nge…)*	Akukaze Nhlobo	Cishe Akukaze	Ngezinye izinkathi	Kaningi	Cishe Njalo Nje
1. Wenza imisebenzi yesikole efana neyenziwa ontanga bakhe	0	1	2	3	4
2. Uyalova esikoleni/enkulisa ngenxa yokungaphili	0	1	2	3	4
3. Uyalova esikoleni/enkulisa ngenxa yokuya kudokotela noma esibhedlela	0	1	2	3	4

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Appendix 5C: PedsQL Child Self-Report Questionnaire and PedsQL Parents Proxy-Report Questionnaire (Afrikaans)

ID-nr._____

Datum:_____

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Inventaris van Pediatriese Lewensgehalte

Version 4.0 - Afrikaans

TIENERVERSLAG (ouderdomme **13-18**)

AANWYSINGS

Op die volgende bladsy is 'n lys dinge wat dalk vir jou 'n probleem kan wees. Vertel ons asseblief **hoeveel van 'n probleem** elkeen gedurende die **afgelope EEN maand** vir jou was, deur 'n kringetjie te trek om:

0 indien dit **nooit** 'n probleem is nie
1 indien dit **amper nooit** 'n probleem is nie
2 indien dit **soms** 'n probleem is
3 indien dit **dikwels** 'n probleem is
4 indien dit **amper altyd** 'n probleem is

Daar is geen regte of verkeerde antwoorde nie.
Indien jy 'n vraag nie verstaan nie, vra asseblief om hulp.

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*In die afgelope **EEN maand**, hoeveel van 'n **probleem** was dit vir jou…*

OOR MY GESONDHEID EN AKTIWITEITE *(probleme met ...)*	**Nooit**	**Amper nooit**	**Soms**	**Dikwels**	**Amper altyd**
1. Dit is vir my moeilik om meer as een straatblok ver te loop	0	1	2	3	4
2. Dit is vir my moeilik om te hardloop	0	1	2	3	4
3. Dit is vir my moeilik om sportaktiwiteite te doen of te oefen	0	1	2	3	4
4. Dit is vir my moeilik om iets swaars op te tel	0	1	2	3	4
5. Ek vind dit moeilik om sélf te bad of te stort	0	1	2	3	4
6. Dit is vir my moeilik om takies in en om die huis te doen	0	1	2	3	4
7. Ek het pyn	0	1	2	3	4
8. Ek het min energie	0	1	2	3	4

OOR MY GEVOELENS *(probleme met …)*	**Nooit**	**Amper nooit**	**Soms**	**Dikwels**	**Amper altyd**
1. Ek voel bang	0	1	2	3	4
2. Ek voel hartseer	0	1	2	3	4
3. Ek voel kwaad	0	1	2	3	4
4. Ek sukkel met slaap	0	1	2	3	4
5. Ek is bekommerd oor wat met my sal gebeur	0	1	2	3	4

HOE MAKLIK EK MET ANDER TIENERS KAN MAATS MAAK OF BLY *(probleme met ...)*	**Nooit**	**Amper nooit**	**Soms**	**Dikwels**	**Amper altyd**
1. Ek sukkel om met ander tieners oor die weg te kom	0	1	2	3	4
2. Ander tieners wil nie met my bevriend wees nie	0	1	2	3	4
3. Ander tieners terg my	0	1	2	3	4
4. Ek kan nie dinge doen wat ander tieners van my ouderdom kan doen nie	0	1	2	3	4
5. Dit is moeilik om met my portuurgroep by te bly	0	1	2	3	4

OOR SKOOL *(probleme met ...)*	**Nooit**	**Amper nooit**	**Soms**	**Dikwels**	**Amper altyd**
1. Dit is moelik om in die klas aandag te gee	0	1	2	3	4
2. Ek vergeet dinge	0	1	2	3	4
3. Ek sukkel om met my skoolwerk by te bly	0	1	2	3	4
4. Ek moet skool misloop omdat ek siek voel	0	1	2	3	4
5. Ek moet skool misloop omdat ek dokter of hospitaal toe moet gaan	0	1	2	3	4

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Datum:_____

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Inventaris van Pediatriese Lewensgehalte

Weergawe 4.0 – Afrikaans (South Africa)

OUERVERSLAG oor **TIENERS** (ouderdomme **13-18**)

AANWYSINGS

Op die volgende bladsy is 'n lys dinge wat dalk 'n probleem vir **u tiener** kan wees. Vertel ons asseblief **hoeveel van 'n probleem** elkeen gedurende die **afgelope EEN maand** vir **u tiener** was, deur omsirkeling van:

0 indien dit **nooit** 'n probleem is nie
1 indien dit **amper nooit** 'n probleem is nie
2 indien dit **soms** 'n probleem is
3 indien dit **dikwels** 'n probleem is
4 indien dit **amper altyd** 'n probleem is

Daar is geen regte of verkeerde antwoorde nie.
Indien u 'n vraag nie verstaan nie, vra asseblief om hulp.

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*In die afgelope **EEN maand**, hoeveel van 'n **probleem** het u tiener gehad met …*

LIGGAAMLIKE FUNKSIONERING ***(probleme met ...)***	**Nooit**	**Amper nooit**	**Soms**	**Dikwels**	**Amper altyd**
1. Meer as een straatblok ver loop	0	1	2	3	4
2. Hardloop	0	1	2	3	4
3. Deelname aan sportaktiwiteit of oefening	0	1	2	3	4
4. Iets swaars optel	0	1	2	3	4
5. Sélf bad of stort	0	1	2	3	4
6. Takies in en om die huis doen	0	1	2	3	4
7. Pyn ervaar	0	1	2	3	4
8. Lae energievlak	0	1	2	3	4

EMOSIONELE FUNKSIONERING ***(probleme met ...)***	**Nooit**	**Amper nooit**	**Soms**	**Dikwels**	**Amper altyd**
1. Bang voel	0	1	2	3	4
2. Hartseer voel	0	1	2	3	4
3. Kwaad voel	0	1	2	3	4
4. Sukkel met slaap	0	1	2	3	4
5. Kommer oor wat met hom of haar sal gebeur	0	1	2	3	4

SOSIALE FUNKSIONERING ***(probleme met ...)***	**Nooit**	**Amper nooit**	**Soms**	**Dikwels**	**Amper altyd**
1. Om met ander tieners oor die weg te kom	0	1	2	3	4
2. Ander tieners wat nie met hom of haar bevriend wil wees nie	0	1	2	3	4
3. Deur ander tieners geterg word	0	1	2	3	4
4. Nie dinge kan doen wat ander tieners van sy of haar ouderdom kan doen nie	0	1	2	3	4
5. Met ander tieners bybly	0	1	2	3	4

SKOOLFUNKSIONERING ***(probleme met ...)***	**Nooit**	**Amper nooit**	**Soms**	**Dikwels**	**Amper altyd**
1. Aandag gee in die klas	0	1	2	3	4
2. Dinge vergeet	0	1	2	3	4
3. Met skoolwerk bybly	0	1	2	3	4
4. Skool misloop omdat hy of sy siek voel	0	1	2	3	4
5. Skool misloop omdat hy of sy dokter of hospitaal toe moet gaan	0	1	2	3	4

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Datum:_____

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Inventaris van Pediatriese Lewensgehalte

Version 4.0 - Afrikaans

KINDERVERSLAG (ouderdomme **8-12**)

AANWYSINGS

Op die volgende bladsy is ’n lys dinge wat dalk vir jou ’n probleem kan wees. Vertel ons asseblief **hoeveel van ’n probleem** elkeen gedurende die **afgelope EEN maand** vir jou was, deur ’n kringetjie te trek om:

0 indien dit **nooit** ’n probleem is nie
1 indien dit **amper nooit** ’n probleem is nie
2 indien dit **soms** ’n probleem is
3 indien dit **dikwels** ’n probleem is
4 indien dit **amper altyd** ’n probleem is

Daar is geen regte of verkeerde antwoorde nie.
Indien jy ’n vraag nie verstaan nie, vra asseblief om hulp.

*In die afgelope **EEN maand**, hoeveel van 'n **probleem** was dit vir jou…*

OOR MY GESONDHEID EN AKTIWITEITE ***(probleme met ...)***	**Nooit**	**Amper nooit**	**Soms**	**Dikwels**	**Amper altyd**
1. Dit is vir my moeilik om meer as een straatblok ver te loop	0	1	2	3	4
2. Dit is vir my moeilik om te hardloop	0	1	2	3	4
3. Dit is vir my moeilik om sportaktiwiteite te doen of te oefen	0	1	2	3	4
4. Dit is vir my moeilik om iets swaars op te tel	0	1	2	3	4
5. Ek vind dit moeilik om sélf te bad of te stort	0	1	2	3	4
6. Dit is vir my moeilik om takies in en om die huis te doen	0	1	2	3	4
7. Ek het pyn	0	1	2	3	4
8. Ek het min energie	0	1	2	3	4

OOR MY GEVOELENS ***(probleme met …)***	**Nooit**	**Amper nooit**	**Soms**	**Dikwels**	**Amper altyd**
1. Ek voel bang	0	1	2	3	4
2. Ek voel hartseer	0	1	2	3	4
3. Ek voel kwaad	0	1	2	3	4
4. Ek sukkel met slaap	0	1	2	3	4
5. Ek is bekommerd oor wat met my sal gebeur	0	1	2	3	4

HOE MAKLIK EK MET ANDER KINDERS KAN MAATS MAAK OF BLY ***(probleme met ...)***	**Nooit**	**Amper nooit**	**Soms**	**Dikwels**	**Amper altyd**
1. Ek sukkel om met ander kinders maats te maak of bly	0	1	2	3	4
2. Ander kinders wil nie met my maats wees nie	0	1	2	3	4
3. Ander kinders terg my	0	1	2	3	4
4. Ek kan nie dinge doen wat ander kinders van my ouderdom kan doen nie	0	1	2	3	4
5. Dit is moeilik om by te bly wanneer ek met ander kinders speel	0	1	2	3	4

OOR SKOOL ***(probleme met ...)***	**Nooit**	**Amper nooit**	**Soms**	**Dikwels**	**Amper altyd**
1. Dit is moelik om in die klas aandag te gee	0	1	2	3	4
2. Ek vergeet dinge	0	1	2	3	4
3. Ek sukkel om met my skoolwerk by te bly	0	1	2	3	4
4. Ek moet skool misloop omdat ek siek voel	0	1	2	3	4
5. Ek moet skool misloop omdat ek dokter of hospitaal toe moet gaan	0	1	2	3	4

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01/00

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ID-nr._____

Datum:_____

PedsQL™

Inventaris van Pediatriese Lewensgehalte

Weergawe 4.0 – Afrikaans (South Africa)

OUERVERSLAG oor **KINDERS** (ouderdomme **8-12**)

AANWYSINGS

Op die volgende bladsy is 'n lys dinge wat dalk 'n probleem vir **u kind** kan wees. Vertel ons asseblief **hoeveel van 'n probleem** elkeen gedurende die **afgelope EEN maand** vir **u kind** was, deur omsirkeling van:

0 indien dit **nooit** 'n probleem is nie
1 indien dit **amper nooit** 'n probleem is nie
2 indien dit **soms** 'n probleem is
3 indien dit **dikwels** 'n probleem is
4 indien dit **amper altyd** 'n probleem is

Daar is geen regte of verkeerde antwoorde nie.
Indien u 'n vraag nie verstaan nie, vra asseblief om hulp.

Mag nie sonder toestemming gereproduseer word nie

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*In die afgelope **EEN maand**, hoeveel van 'n **probleem** het u kind gehad met ...*

LIGGAAMLIKE FUNKSIONERING ***(probleme met ...)***	**Nooit**	**Amper nooit**	**Soms**	**Dikwels**	**Amper altyd**
1. Meer as een straatblok ver loop	0	1	2	3	4
2. Hardloop	0	1	2	3	4
3. Deelname aan sportaktiwiteit of oefening	0	1	2	3	4
4. Iets swaars optel	0	1	2	3	4
5. Sélf bad of stort	0	1	2	3	4
6. Takies in en om die huis doen	0	1	2	3	4
7. Pyn ervaar	0	1	2	3	4
8. Lae energievlak	0	1	2	3	4

EMOSIONELE FUNKSIONERING ***(probleme met ...)***	**Nooit**	**Amper nooit**	**Soms**	**Dikwels**	**Amper altyd**
1. Bang voel	0	1	2	3	4
2. Hartseer voel	0	1	2	3	4
3. Kwaad voel	0	1	2	3	4
4. Sukkel met slaap	0	1	2	3	4
5. Kommer oor wat met hom of haar sal gebeur	0	1	2	3	4

SOSIALE FUNKSIONERING ***(probleme met ...)***	**Nooit**	**Amper nooit**	**Soms**	**Dikwels**	**Amper altyd**
1. Oor die weg kom met ander kinders	0	1	2	3	4
2. Ander kinders wat nie met hom of haar bevriend wil wees nie	0	1	2	3	4
3. Deur ander kinders geterg word	0	1	2	3	4
4. Nie dinge kan doen wat ander kinders van sy of haar ouderdom kan doen nie	0	1	2	3	4
5. Bybly wanneer hy of sy met ander kinders speel	0	1	2	3	4

SKOOLFUNKSIONERING ***(probleme met ...)***	**Nooit**	**Amper nooit**	**Soms**	**Dikwels**	**Amper altyd**
1. Aandag gee in die klas	0	1	2	3	4
2. Dinge vergeet	0	1	2	3	4
3. Met skoolwerk bybly	0	1	2	3	4
4. Skool misloop omdat hy of sy siek voel	0	1	2	3	4
5. Skool misloop omdat hy of sy dokter of hospitaal toe moet gaan	0	1	2	3	4

PedsQL 4.0 - Parent (8-12)
01/00

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Datum:_____

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Inventaris van Pediatriese Lewensgehalte

Version 4.0 – Afrikaans

KLEUTERVERSLAG (ouderdomme **5-7**)

Aanwysings vir onderhoudvoerder:

Ek gaan vir jou 'n paar vrae vra oor dinge wat dalk vir sommige kinders 'n probleem kan wees. Ek wil graag weet hoeveel van 'n probleem enige van hierdie dinge dalk vir jou kan wees.

Wys die kind die sjabloon en wys na die antwoorde terwyl u voorlees.

As dit <u>glad nie</u> vir jou 'n probleem is nie, wys na die gesiggie wat glimlag

As dit is <u>soms</u> vir jou 'n probleem is, wys na die middelste gesiggie

As dit <u>baie keer</u> vir jou 'n probleem is, wys na die gesiggie wat frons

Ek sal elke vraag voorlees. Wys na die prentjies om vir my te wys hoeveel van 'n probleem dit vir jou is. Kom ons oefen dit eers.

	Glad nie	Soms	Baie keer
Is dit vir jou moeilik om jou vingers te klap	☺	😐	☹

Sê vir die kind om te wys hoe hy of sy vingers klap om te bepaal of die vraag korrek beantwoord is of nie. Herhaal die vraag indien die kind 'n antwoord gee wat anders is as dit wat hy of sy kon doen.

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Dink oor hoe dit met jou gegaan het in die paar weke wat nou verby is. Luister asseblief mooi na elke sin, en vertel my hoeveel van 'n probleem dit vir jou is.

Wys na die sjabloon nadat u die item gelees het. As die kind aarsel of as dit lyk asof hy of sy nie verstaan hoe om te antwoord nie, lees die antwoordopsies terwyl u na die gesigte wys.

LIGGAAMLIKE FUNKSIONERING *(probleme met ...)*	**Glad nie**	**Soms**	**Baie keer**
1. Is dit vir jou moeilik om te loop	0	2	4
2. Is dit vir jou moeilik om te hardloop	0	2	4
3. Is dit vir jou moeilik om sport te doen of te oefen	0	2	4
4. Is dit vir jou moeilik om groot dinge op te tel	0	2	4
5. Is dit vir jou moeilik om te bad of te stort	0	2	4
6. Is dit vir jou moeilik om takies te doen (soos om jou speelgoed op te tel)	0	2	4
7. Het jy pyn (***Waar?*** _____)	0	2	4
8. Voel jy ooit te moeg om te speel	0	2	4

Onthou, jy moet vir my sê hoeveel van 'n probleem dit vir jou was in die paar weke wat nou verby is.

EMOSIONELE FUNKSIONERING *(probleme met ...)*	**Glad nie**	**Soms**	**Baie keer**
1. Voel jy bang	0	2	4
2. Voel jy hartseer	0	2	4
3. Voel jy kwaad	0	2	4
4. Sukkel jy met slaap	0	2	4
5. Is jy bekommerd oor wat met jou sal gebeur	0	2	4

SOSIALE FUNKSIONERING *(probleme met ...)*	**Glad nie**	**Soms**	**Baie keer**
1. Is dit vir jou moeilik om met ander kinders maats te wees	0	2	4
2. Sê ander kinders dat hulle nie met jou wil speel nie	0	2	4
3. Terg ander kinders jou	0	2	4
4. Kan ander kinders dinge doen wat jy nie kan doen nie	0	2	4
5. Is dit vir jou moeilik om by te bly wanneer jy met ander kinders speel	0	2	4

SKOOLFUNKSIONERING *(probleme met ...)*	**Glad nie**	**Soms**	**Baie keer**
1. Is dit vir jou moeilik om in die skool mooi te luister wat die juffrou of meneer sê	0	2	4
2. Vergeet jy dinge	0	2	4
3. Is dit moeilik om skoolwerk gou genoeg klaar te kry	0	2	4
4. Loop jy skool mis omdat jy siek voel	0	2	4
5. Loop jy skool mis omdat jy dokter of hospitaal toe moet gaan	0	2	4

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Hoeveel van ’n probleem is dit vir jou

Glad nie



Soms



Baie keer



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Datum:_____

PedsQL™

Inventaris van Pediatriese Lewensgehalte

Weergawe 4.0 Afrikaans (South Africa)

OUERVERSLAG oor **KLEUTERS** (ouderdomme **5-7**)

AANWYSINGS

Op die volgende bladsy is 'n lys dinge wat dalk 'n probleem vir **u kind** kan wees. Vertel ons asseblief **hoeveel van 'n probleem** elkeen gedurende die **afgelope EEN maand** vir **u kind** was, deur omsirkeling van:

0 indien dit **nooit** 'n probleem is nie
1 indien dit **amper nooit** 'n probleem is nie
2 indien dit **soms** 'n probleem is
3 indien dit **dikwels** 'n probleem is
4 indien dit **amper altyd** 'n probleem is

Daar is geen regte of verkeerde antwoorde nie.
Indien u 'n vraag nie verstaan nie, vra asseblief om hulp.

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*In die afgelope **EEN maand**, hoeveel van 'n **probleem** het u kind gehad met ...*

LIGGAAMLIKE FUNKSIONERING *(probleme met ...)*	Nooit	Amper nooit	Soms	Dikwels	Amper altyd
1. Meer as een straatblok ver loop	0	1	2	3	4
2. Hardloop	0	1	2	3	4
3. Deelname aan sportaktiwiteit of oefening	0	1	2	3	4
4. Iets swaars optel	0	1	2	3	4
5. Sélf bad of stort	0	1	2	3	4
6. Takies doen, soos sy of haar speelgoed optel	0	1	2	3	4
7. Pyn ervaar	0	1	2	3	4
8. Lae energievlak	0	1	2	3	4

EMOSIONELE FUNKSIONERING *(probleme met ...)*	Nooit	Amper nooit	Soms	Dikwels	Amper altyd
1. Bang voel	0	1	2	3	4
2. Hartseer voel	0	1	2	3	4
3. Kwaad voel	0	1	2	3	4
4. Sukkel met slaap	0	1	2	3	4
5. Kommer oor wat met hom of haar sal gebeur	0	1	2	3	4

SOSIALE FUNKSIONERING *(probleme met ...)*	Nooit	Amper nooit	Soms	Dikwels	Amper altyd
1. Oor die weg kom met ander kinders	0	1	2	3	4
2. Ander kinders wat nie met hom of haar bevriend wil wees nie	0	1	2	3	4
3. Deur ander kinders geterg word	0	1	2	3	4
4. Nie dinge kan doen wat ander kinders van sy of haar ouderdom kan doen nie	0	1	2	3	4
5. Bybly wanneer hy of sy met ander kinders speel	0	1	2	3	4

SKOOLFUNKSIONERING *(probleme met ...)*	Nooit	Amper nooit	Soms	Dikwels	Amper altyd
1. Aandag gee in die klas	0	1	2	3	4
2. Dinge vergeet	0	1	2	3	4
3. Bybly met skoolaktiwiteite	0	1	2	3	4
4. Skool misloop omdat hy of sy siek voel	0	1	2	3	4
5. Skool misloop omdat hy of sy dokter of hospitaal toe moet gaan	0	1	2	3	4

PedsQL 4.0 - Parent (5-7)
01/00

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ID-nr._____

Datum:_____

PedsQL™

Inventaris van Pediatriese Lewensgehalte

Weergawe 4.0 – Afrikaans (South Africa)

OUERVERSLAG oor **PEUTERS** (ouderdomme **2-4**)

AANWYSINGS

Op die volgende bladsy is 'n lys dinge wat dalk 'n probleem vir **u kind** kan wees. Vertel ons asseblief **hoeveel van 'n probleem** elkeen gedurende die **afgelope EEN maand** vir **u kind** was, deur omsirkeling van:

0 indien dit **nooit** 'n probleem is nie
1 indien dit **amper nooit** 'n probleem is nie
2 indien dit **soms** 'n probleem is
3 indien dit **dikwels** 'n probleem is
4 indien dit **amper altyd** 'n probleem is

Daar is geen regte of verkeerde antwoorde nie.
Indien u 'n vraag nie verstaan nie, vra asseblief om hulp.

Mag nie sonder toestemming gereproduseer word nie

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*In die afgelope **EEN maand**, hoeveel van 'n **probleem** het u kind gehad met ...*

LIGGAAMLIKE FUNKSIONERING ***(probleme met ...)***	**Nooit**	**Amper nooit**	**Soms**	**Dikwels**	**Amper altyd**
1. Loop	0	1	2	3	4
2. Hardloop	0	1	2	3	4
3. Deelname aan aktiewe spel of oefening	0	1	2	3	4
4. Iets swaars optel	0	1	2	3	4
5. Bad	0	1	2	3	4
6. Help om sy of haar speelgoed op te tel	0	1	2	3	4
7. Pyn ervaar	0	1	2	3	4
8. Lae energievlak	0	1	2	3	4

EMOSIONELE FUNKSIONERING ***(probleme met ...)***	**Nooit**	**Amper nooit**	**Soms**	**Dikwels**	**Amper altyd**
1. Bang voel	0	1	2	3	4
2. Hartseer voel	0	1	2	3	4
3. Kwaad voel	0	1	2	3	4
4. Sukkel met slaap	0	1	2	3	4
5. Homself/haarself bekommer	0	1	2	3	4

SOSIALE FUNKSIONERING ***(probleme met ...)***	**Nooit**	**Amper nooit**	**Soms**	**Dikwels**	**Amper altyd**
1. Speel met ander kinders	0	1	2	3	4
2. Ander kinders wat nie met hom of haar wil speel nie	0	1	2	3	4
3. Deur ander kinders geterg word	0	1	2	3	4
4. Nie dinge kan doen wat ander kinders van sy of haar ouderdom kan doen nie	0	1	2	3	4
5. Bybly wanneer hy of sy met ander kinders speel	0	1	2	3	4

****Vul asseblief hierdie afdeling in indien u kind skool of dagsorg bywoon***

SKOOLFUNKSIONERING ***(probleme met ...)***	**Nooit**	**Amper nooit**	**Soms**	**Dikwels**	**Amper altyd**
1. Dieselfde skoolaktiwiteite as kinders van dieselfde ouderdom doen	0	1	2	3	4
2. Skool/dagsorg misloop omdat hy of sy siek voel	0	1	2	3	4
3. Skool/dagsorg misloop omdat hy of sy dokter of hospitaal toe moet gaan	0	1	2	3	4

PedsQL 4.0 - Parent (2-4)
01/00

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Appendix 6: Letter Requesting Research Study Permission Sample

Faculty of Health Sciences
University of the Witwatersrand
Johannesburg, South Africa
Private Bag 3
WITS 2050

Mr. Makhosonke Mkhaliphi
Amajuba Memorial Hospital
East Street Extension
Volksrust
Mpumalanga
2470

Dear Mr Makhosonke Mkhaliphi
Subject: Permission to Conduct Research Study

I, Panashe Furusa, a Masters in Physiotherapy student would like to request permission to carry out a research study at Amajuba Memorial Hospital.

As per the research proposal, the aim of the research study is to identify the epidemiology of upper limb fracture incidences and establish the effects of upper limb fractures (ULF) on the quality of life in school-going children living in rural Southern Africa. Previous studies and literature outline the effects of ULF on physical activity levels however, there are no known studies that investigate the effects on overall quality of life of children living in rural Southern Africa.

Children in rural Southern Africa are often not exposed to technological devices of play, mostly relying on active physical play as their main form of interaction and play. Children often develop a fear of movement during this immobilization period and avoid physical activity altogether, further impacting their level of physical activity.

Therefore, it is important to establish the effects of these factors on their health-related quality of life.
The epidemiology of ULF will be investigated and established. A review of all paediatric patients with ULF will be done by the researcher. All the hospital files under the orthopaedic and physiotherapy departments will be surveyed only once, using a data collecting tool which is in the form of a computer programme. The data will look at hospital statistics regarding the point prevalence of paediatric ULF, types of fractures, cause of injury and age at time of injury.

Participants will have anthropometric measures (height and weight) taken by the principal investigator and recorded on the data collection sheet by the principal investigator. The measurements will also be recorded on the RedCap data collection system on the day of their assessment. The PedsQL questionnaire will be administered by investigating physiotherapists. Participants in the comparison group who may not have files at the hospital will have their height, weight and vitals measured on site using the hospital's own equipment. The parents will receive education and the PedsQL testing procedure will be explained to both parents and children beforehand.

Amajuba Memorial Hospital has a high patient population with children who will fall into the study's inclusion criteria, therefore facilitating participation intake necessary to carry out this study.

Thank you for your time and consideration.

Kind regards,
Panashe Furusa
Masters in Physiotherapy student
University of the Witwatersrand

Appendix 7A- Letter of Support (Amajuba Memorial Hospital)

health
MPUMALANGA PROVINCE
REPUBLIC OF SOUTH AFRICA

MPUMALANGA
THE PLACE OF THE RISING SUN

No.3, Government Boulevard, Riverside Park, Ext. 2, Mbombela, 1200, Mpumalanga Province
Private Bag X11285, Mbombela, 1200, Mpumalanga Province
Tel I: +27 (13) 766 3429, Fax: +27 (13) 766 3458

Litiko Letemphilo | Departement van Gesondheid | UmNyango WezeMaphilo

Letter of Support (To be signed by relevant Senior Managers/Responsibility Managers)

1. Study Details	
1.1 Name of Applicant	Panashe Marble Furusa
1.2 Contact Number:	**(0)** 796588104
1.3 Study Title:	The prevalence of paediatric upper limb fractures and their effect on the quality of life of children in rural Mpumalanga, South Africa
1.4 Data collection period to undertake the study:	**Start:** 10/2022 **End:** 10/2023
Data collection period subject to final approval from HREC (Human Research Ethics Committee)	

1.5 Provide summary of the study, study area, and how data will be collected (your response should not be more than the space provided:

Upper limb fractures account for 57% of fractures of children in the South African population (Safiejko, et al., 2019). Fractures in healthy children and adolescents primarily occur as a result of trauma following a sporting activity, fall during play or motor vehicle accidents (Stevens, et al., 2012)

This study will contribute to establishing baseline demographics of children incurring upper limb fractures and the prevalence of upper limb fractures of children living in rural South Africa. Additionally, this study will contribute to scientific literature that investigates the effects on overall quality of life of children living in rural South Africa, following an upper limb fracture that has been conservatively managed. Children often develop a fear of movement during this immobilization period and avoid physical activity altogether, decreasing their level of physical activity (Liebs, et al., 2021). This study aims to establish the effects of upper limb fractures on the health-related quality of life and investigate how upper limb fractures impact activities of daily life and play in children.

Part A is a retrospective record review, patient hospital files are reviewed to interpret descriptive data for evaluation. This process involves the extraction of relevant information from patient records by analysing the many documents found within each patient file.

Part B is a cohort study; a clinical research study in which participants who meet the inclusion criteria are followed and analysed over time. The Paediatric Quality of Life Inventory (PedsQL) will be administered as an assessment tool.

The study aims to investigate the prevalence of upper limb fractures and establish the effects of upper limb fractures on the quality of life in school-going children living in rural Mpumalanga, South Africa.

Please note that this letter is not an approval to undertake a study, but a support letter from identified facility/district.
i.e. the CEO/District Manager acknowledges to have been consulted on the study

2. Resources Required from Facility/Sub-district/Community

2.1 Facility Staff Required to assist with the Study	**Yes** ● **How many:** Nurses: 0 Doctors: 0 Space: Other, please specify: 1 Physiotherapist	**NO** ☐
2.2 Patients / Researchers' Records/Files	**Yes** ● Part A (retrospective review) and Part B Year: From: 01/2019 To: 10/2023	**NO** ☐
2.3 Interviewing Patients/ participants at Facilities	**Yes** ● From October 2022 (subject to HREC approval)	**NO** ☐
2.4 Interviewing Patients/ participants at Home	**Yes** ☐	**NO** ●
2.5 Other, please specify:	N/A	

3 Resource flow/benefits to the Provincial Department

3.1 The research is responsive to which National/Provincial/departmental priority/strategy/research agenda.

- **State your response:** - Acquiring accurate data on the prevalence and incidence of NCDs in the population through active case finding
  - Referral systems

3.2 Resource Flow (Are there benefits to Patients/community)	**Yes** ● Please list: all potential remedial ideas emanated from research will be taken up for healthcare practice and policy To identify and address the impact on activities of daily life and play in children in order to advocate for early physiotherapy intervention and improve physical rehabilitation.	**NO** ☐
3.3 Resource Flow (Are there benefits to Facility/District)	**Yes** ● Please list: to create a linkage between all research stakeholders The findings of the study aim to improve the referral pathways of physiotherapy intervention in children with simple upper limb fractures in the facility and improve physiotherapy management of the condition.	**NO** ☐

4 Availability of Required Clearance/s

4.1 Ethical Clearance	**Yes** ☐ Clearance Number:	**Pending** ●	**NO** ☐
4.2 Clinical Trial	**Yes** ☐ Clearance Number:	**Pending** ☐	**NO** ●
4.3 Vaccine Trial	**Yes** ☐ Clearance Number:	**Pending** ☐	**NO** ●
4.4 Is conducted in a village led by tribal authority?	**Yes** ☐ Not Applicable ☐ Date tribal authority engaged:		**NO** ●

Please note that this letter is not an approval to undertake a study, but a support letter from identified facility/district. i.e. the CEO/District Manager acknowledges to have been consulted on the study

5 Declaration

Declaration by Applicant:

I Mr/Ms/Dr/Prof/Adv. Panashe Marble Furusa agree to submit/present the result of this study back to the CEO/Institution/District.

Estimated date of feedback: 1-Dec-23

To be signed by a relevant CEO/District Manager/Programme Manager/Senior Manager in Mpumalanga Province

Supported / **Not Supported**

SUPPORTED FOR THE STUDY TITLED "THE PREVALENCE OF PAEDIATRIC UPPER LIMB FRACTURES AND THEIR EFFECT ON THE QUALITY OF LIFE OF CHILDREN IN RURAL MPUMALANGA.

Signature: [signature] **Date:** 08/09/2022

Name: MR RICHARD MAKHOSONKE MKHALIPHI

MPUMALANGA
DEPARTMENT OF HEALTH
AMAJUBA MEMORIAL HOSPITAL
2022 -09- 08
CEO OFFICE
PRIVATE BAG X9006
VOLKSRUST 2470

Stamp

A duly signed form can be uploaded on the nhrd website by the researcher or emailed to: JerryS@mpuhealth.gov.za or ThembaM@mpuhealth.gov.za

Please note that this letter is not an approval to undertake a study, but a support letter from identified facility/district.
i.e. the CEO/District Manager acknowledges to have been consulted on the study

Appendix 7B- Letter of Support (Bethal Hospital)

health
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No.3, Government Boulevard, Riverside Park, Ext. 2, Mbombela, 1200, Mpumalanga Province
Private Bag X11285, Mbombela, 1200, Mpumalanga Province
Tel I: +27 (13) 766 3429, Fax: +27 (13) 766 3458

Litiko Letemphilo | Departement van Gesondheid | UmNyango WezeMaphilo

Letter of Support (To be signed by relevant Senior Managers/Responsibility Managers)

1. Study Details	
1.1 Name of Applicant	Panashe Marble Furusa
1.2 Contact Number:	**(0)** 796588104
1.3 Study Title:	The prevalence of paediatric upper limb fractures and their effect on the quality of life of children in rural Mpumalanga, South Africa
1.4 Data collection period to undertake the study:	**Start:** 10/2022 **End:** 12/2023

1.5 Provide summary of the study, study area, and how data will be collected (your response should not be more than the space provided:

Upper limb fractures account for 57% of fractures of children in the South African population (Safiejko, et al., 2019). Fractures in healthy children and adolescents primarily occur as a result of trauma following a sporting activity, fall during play or motor vehicle accidents (Stevens, et al., 2012)

This study will contribute to establishing baseline demographics of children incurring upper limb fractures and the prevalence of upper limb fractures of children living in rural South Africa. Additionally, this study will contribute to scientific literature that investigates the effects on overall quality of life of children living in rural South Africa, following an upper limb fracture that has been conservatively managed. Children often develop a fear of movement during this immobilization period and avoid physical activity altogether, decreasing their level of physical activity (Liebs, et al., 2021). This study aims to establish the effects of upper limb fractures on the health-related quality of life and investigate how upper limb fractures impact activities of daily life and play in children.

Part A is a retrospective record review, patient hospital files are reviewed to interpret descriptive data for evaluation. This process involves the extraction of relevant information from patient records by analysing the many documents found within each patient file.

Part B is a cohort study; a clinical research study in which participants who meet the inclusion criteria are followed and analysed over time. The Paediatric Quality of Life Inventory (PedsQL) will be administered as an assessment tool.

The study aims to investigate the prevalence of upper limb fractures and establish the effects of upper limb fractures on the quality of life in school-going children living in rural Mpumalanga, South Africa.

Mpumalanga Department of Health Approval Reference Number: MP_202204_007
Wits Human Research Ethics Committee Clearance Certificate: M220711

Please note that this letter is not an approval to undertake a study, but a support letter from identified facility district. i.e. the CEO/District Manager acknowledges to have been consulted on the study

2. Resources Required from Facility/Sub-district/Community		
2.1 Facility Staff Required to assist with the Study	**Yes** ● **How many:** Nurses: 0 Doctors: 0 Space: Other, please specify: 1 Physiotherapist	**NO** ☐
2.2 Patients / Researchers' Records/Files	**Yes** ● Year: From: 01/2019 To: 12/2023	**NO** ☐
2.3 Interviewing Patients/ participants at Facilities	**Yes** ●	**NO** ☐
2.4 Interviewing Patients/ participants at Home	**Yes** ☐	**NO** ●
2.5 Other, please specify:	N/A	

3 Resource flow/benefits to the Provincial Department		
3.1 The research is responsive to which National/Provincial/departmental priority/strategy/research agenda. • **State your response:** - Acquiring accurate data on the prevalence and incidence of NCDs in the population through active case finding - Referral systems		
3.2 Resource Flow (Are there benefits to Patients/community)	**Yes** ● Please list: all potential remedial ideas emanated from research will be taken up for healthcare practice and policy To identify and address the impact on activities of daily life and play in children in order to advocate for early physiotherapy intervention and improve physical	**NO** ☐
3.3 Resource Flow (Are there benefits to Facility/District)	**Yes** ● Please list: to create a linkage between all research stakeholders The findings of the study aim to improve the referral pathways of physiotherapy intervention in children with simple upper limb fractures in the facility and improve physiotherapy management of the condition	**NO** ☐

4 Availability of Required Clearance/s			
4.1 Ethical Clearance	**Yes** ● Clearance Number: M220711	**Pending** ☐	**NO** ☐
4.2 Clinical Trial	**Yes** ☐ Clearance Number: M220711	**Pending** ☐	**NO** ●
4.3 Vaccine Trial	**Yes** ☐ Clearance Number: M220711	**Pending** ☐	**NO** ●
4.4 Is conducted in a village led by tribal authority?	**Yes** ☐ **Not Applicable** ☐ Date tribal authority engaged:		**NO** ●

Please note that this letter is not an approval to undertake a study, but a support letter from identified facility district. i.e. the CEO District Manager acknowledges to have been consulted on the study

5 Declaration

Declaration by Applicant:

I Mr/Ms/Dr/Prof/Adv. Panashe Marble Furusa agree to submit/present the result of this study back to the CEO/Institution/District.

Estimated date of feedback: 31-Dec-23

To be signed by a relevant CEO/~~District Manager~~/~~Programme Manager~~/~~Senior Manager~~ in Mpumalanga Province

~~Supported~~ / ~~Not Supported~~

Signature: _____ **Date:** 2023/03/03

Name: MANDLA MTEMBO KA-MAMZA

MPUMALANGA PROVINCIAL ADMINISTRATION
BETHAL HOSPITAL
PRIVATE BAG X1005
03 MAR 2023
CEO
BETHAL HOSPITAL

A duly signed form can be uploaded on the nhrd website by the researcher or emailed to: JerryS@mpuhealth.gov.za or ThembaM@mpuhealth.gov.za

Please note that this letter is not an approval to undertake a study, but a support letter from identified facility/district.
i.e. the CEO/District Manager acknowledges to have been consulted on the study

Appendix 7C- Letter of Support (Bernice Samuel Hospital)

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Private Bag X11285, Mbombela, 1200, Mpumalanga Province
Tel I: +27 (13) 766 3429, Fax: +27 (13) 766 3458

Litiko Letemphilo | Departement van Gesondheid | UmNyango WezeMaphilo

Letter of Support (To be signed by relevant Senior Managers/Responsibility Managers)

1. Study Details	
1.1 Name of Applicant	Panashe Marble Furusa
1.2 Contact Number:	(0) 796588104
1.3 Study Title:	The prevalence of paediatric upper limb fractures and their effect on the quality of life of children in rural Mpumalanga, South Africa
1.4 Data collection period to undertake the study:	Start: 10/2022 End: 12/2023
Data collection period subject to final approval from HREC (Human Research Ethics Committee)	

1.5 Provide summary of the study, study area, and how data will be collected (your response should not be more than the space provided:

Upper limb fractures account for 57% of fractures of children in the South African population (Safiejko, et al., 2019). Fractures in healthy children and adolescents primarily occur as a result of trauma following a sporting activity, fall during play or motor vehicle accidents (Stevens, et al., 2012)

This study will contribute to establishing baseline demographics of children incurring upper limb fractures and the prevalence of upper limb fractures of children living in rural South Africa. Additionally, this study will contribute to scientific literature that investigates the effects on overall quality of life of children living in rural South Africa, following an upper limb fracture that has been conservatively managed. Children often develop a fear of movement during this immobilization period and avoid physical activity altogether, decreasing their level of physical activity (Liebs, et al., 2021). This study aims to establish the effects of upper limb fractures on the health-related quality of life and investigate how upper limb fractures impact activities of daily life and play in children.

Part A is a retrospective record review, patient hospital files are reviewed to interpret descriptive data for evaluation. This process involves the extraction of relevant information from patient records by analysing the many documents found within each patient file.

Part B is a cohort study; a clinical research study in which participants who meet the inclusion criteria are followed and analysed over time. The Paediatric Quality of Life Inventory (PedsQL) will be administered as an assessment tool.

The study aims to investigate the prevalence of upper limb fractures and establish the effects of upper limb fractures on the quality of life in school-going children living in rural Mpumalanga, South Africa.

Mpumalanga Department of Health Approval Reference Number: MP_202204_007
Wits Human Research Ethics Committee Clearance Certificate: M220711

Please note that this letter is not an approval to undertake a study, but a support letter from identified facility/district.
i.e. the CEO/District Manager acknowledges to have been consulted on the study

2. Resources Required from Facility/Sub-district/Community		
2.1 Facility Staff Required to assist with the Study	**Yes** ● **How many:** Nurses: 0 Doctors: 0 Space: Other, please specify: 1 Physiotherapist	**NO**
2.2 Patients / Researchers' Records/Files	**Yes** ● Part A (retrospective review) and Part B Year: From: 01/2019 To: 12/2023	**NO**
2.3 Interviewing Patients/ participants at Facilities	**Yes** ● From October 2022 (subject to HREC approval)	**NO**
2.4 Interviewing Patients/ participants at Home	**Yes**	**NO** ●
2.5 Other, please specify:	N/A	

3 Resource flow/benefits to the Provincial Department		
3.1 The research is responsive to which National/Provincial/departmental priority/strategy/research agenda. • **State your response:** - Acquiring accurate data on the prevalence and incidence of NCDs in the population through active case finding - Referral systems		
3.2 Resource Flow (Are there benefits to Patients/community)	**Yes** ● Please list: all potential remedial ideas emanated from research will be taken up for healthcare practice and policy To identify and address the impact on activities of daily life and play in children in order to advocate for early physiotherapy intervention and improve physical rehabilitation.	**NO**
3.3 Resource Flow (Are there benefits to Facility/District)	**Yes** ● Please list: to create a linkage between all research stakeholders The findings of the study aim to improve the referral pathways of physiotherapy intervention in children with simple upper limb fractures in the facility and improve physiotherapy management of the condition.	**NO**

4 Availability of Required Clearance/s			
4.1 Ethical Clearance	**Yes** ● Clearance Number: M220711	**Pending**	**NO**
4.2 Clinical Trial	**Yes** Clearance Number: M220711	**Pending**	**NO** ●
4.3 Vaccine Trial	**Yes** Clearance Number: M220711	**Pending**	**NO** ●
4.4 Is conducted in a village led by tribal authority?	**Yes** Date tribal authority engaged:	Not Applicable	**NO** ●

Please note that this letter is not an approval to undertake a study, but a support letter from identified facility/district.
i.e. the CEO/District Manager acknowledges to have been consulted on the study

5 Declaration

Declaration by Applicant:

I Mr/Ms/Dr/Prof/Adv. Panashe Marble Furusa agree to submit/present the result of this study back to the CEO/Institution/District.

Estimated date of feedback: 31-Dec-23

To be signed by a relevant CEO/~~District Manager~~/P~~rogramme Manager~~/~~Senior Manager~~ in Mpumalanga Province

Supported / Not Supported

Signature: _____ **Date:** 2023/03/24

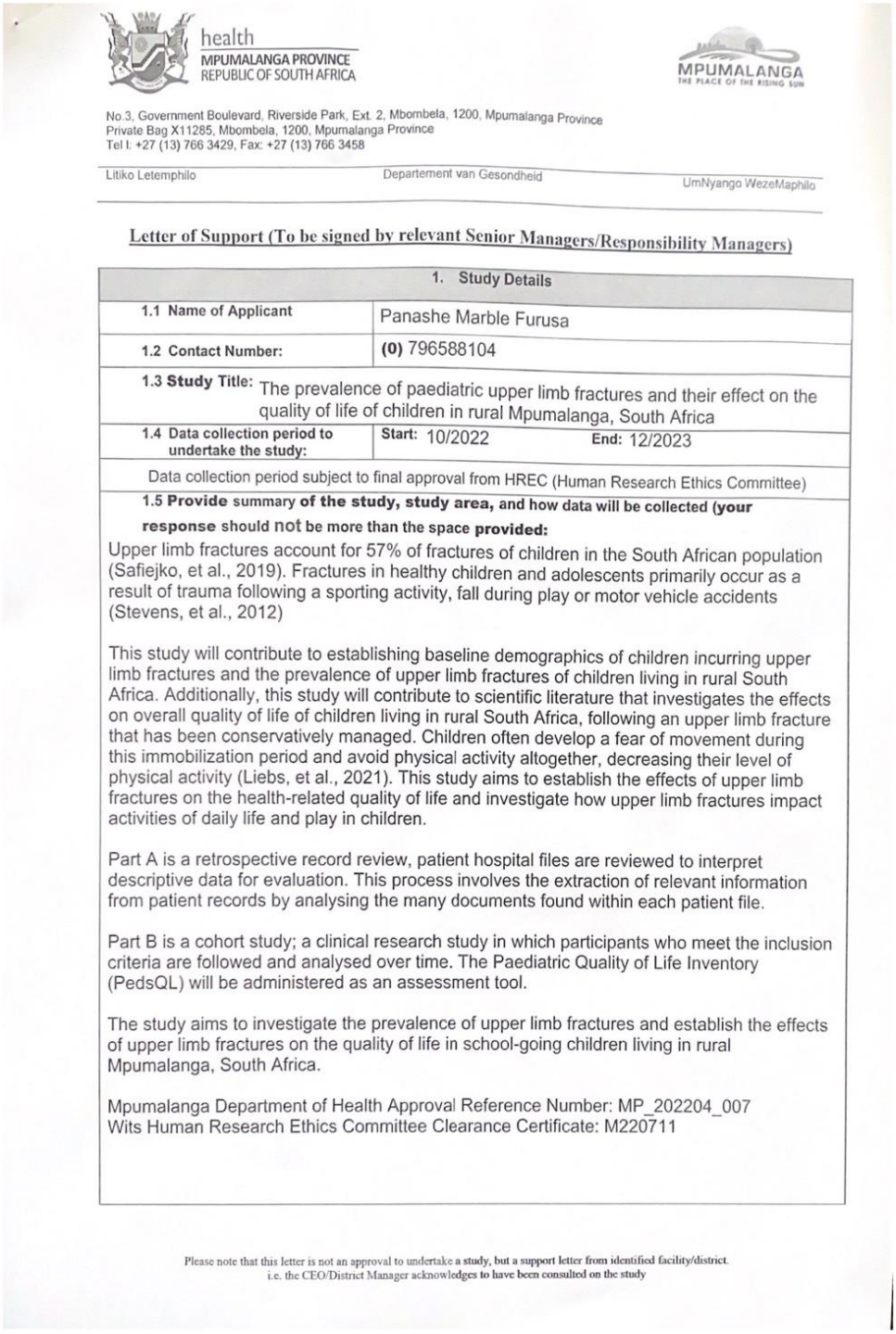
Name: Dr TEMA FRANCO

BERNICE SAMUEL HOSPITAL
CHIEF EXECUTIVE OFFICER
2023 -03- 24
DEPARTMENT OF HEALTH
TEL 013 665 8200

A duly signed form can be uploaded on the nhrd website by the researcher or emailed to: JerryS@mpuhealth.gov.za or ThembaM@mpuhealth.gov.za

Please note that this letter is not an approval to undertake a study, but a support letter from identified facility/district. i.e. the CEO/District Manager acknowledges to have been consulted on the study

Appendix 7D- Letter of Support (Evander Hospital)



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Tel I: +27 (13) 766 3429, Fax: +27 (13) 766 3458

Litiko Letemphilo | Departement van Gesondheid | UmNyango WezeMaphilo

Letter of Support (To be signed by relevant Senior Managers/Responsibility Managers)

1. Study Details	
1.1 Name of Applicant	Panashe Marble Furusa
1.2 Contact Number:	(0) 796588104
1.3 Study Title:	The prevalence of paediatric upper limb fractures and their effect on the quality of life of children in rural Mpumalanga, South Africa
1.4 Data collection period to undertake the study:	Start: 10/2022 End: 12/2023
Data collection period subject to final approval from HREC (Human Research Ethics Committee)	

1.5 Provide summary of the study, study area, and how data will be collected (your response should not be more than the space provided:

Upper limb fractures account for 57% of fractures of children in the South African population (Safiejko, et al., 2019). Fractures in healthy children and adolescents primarily occur as a result of trauma following a sporting activity, fall during play or motor vehicle accidents (Stevens, et al., 2012)

This study will contribute to establishing baseline demographics of children incurring upper limb fractures and the prevalence of upper limb fractures of children living in rural South Africa. Additionally, this study will contribute to scientific literature that investigates the effects on overall quality of life of children living in rural South Africa, following an upper limb fracture that has been conservatively managed. Children often develop a fear of movement during this immobilization period and avoid physical activity altogether, decreasing their level of physical activity (Liebs, et al., 2021). This study aims to establish the effects of upper limb fractures on the health-related quality of life and investigate how upper limb fractures impact activities of daily life and play in children.

Part A is a retrospective record review, patient hospital files are reviewed to interpret descriptive data for evaluation. This process involves the extraction of relevant information from patient records by analysing the many documents found within each patient file.

Part B is a cohort study; a clinical research study in which participants who meet the inclusion criteria are followed and analysed over time. The Paediatric Quality of Life Inventory (PedsQL) will be administered as an assessment tool.

The study aims to investigate the prevalence of upper limb fractures and establish the effects of upper limb fractures on the quality of life in school-going children living in rural Mpumalanga, South Africa.

Mpumalanga Department of Health Approval Reference Number: MP_202204_007
Wits Human Research Ethics Committee Clearance Certificate: M220711

Please note that this letter is not an approval to undertake a study, but a support letter from identified facility/district.
i.e. the CEO/District Manager acknowledges to have been consulted on the study

2. Resources Required from Facility/Sub-district/Community		
2.1 Facility Staff Required to assist with the Study	**Yes** ● **How many:** Nurses: 0 Doctors: 0 Space: Other, please specify: 1 Physiotherapist	**NO**
2.2 Patients / Researchers' Records/Files	**Yes** ● Part A (retrospective review) and Part B Year: From: 01/2019 To: 12/2023	**NO**
2.3 Interviewing Patients/ participants at Facilities	**Yes** ● From October 2022 (subject to HREC approval)	**NO**
2.4 Interviewing Patients/ participants at Home	**Yes**	**NO** ●
2.5 Other, please specify:	N/A	

3 Resource flow/benefits to the Provincial Department		
3.1 The research is responsive to which National/Provincial/departmental priority/strategy/research agenda. • **State your response:** - Acquiring accurate data on the prevalence and incidence of NCDs in the population through active case finding - Referral systems		
3.2 Resource Flow (Are there benefits to Patients/community)	**Yes** ● Please list: all potential remedial ideas emanated from research will be taken up for healthcare practice and policy To identify and address the impact on activities of daily life and play in children in order to advocate for early physiotherapy intervention and improve physical rehabilitation.	**NO**
3.3 Resource Flow (Are there benefits to Facility/District)	**Yes** ● Please list: to create a linkage between all research stakeholders The findings of the study aim to improve the referral pathways of physiotherapy intervention in children with simple upper limb fractures in the facility and improve physiotherapy management of the condition.	**NO**

4 Availability of Required Clearance/s			
4.1 Ethical Clearance	**Yes** ● Clearance Number: M220711	**Pending**	**NO**
4.2 Clinical Trial	**Yes** Clearance Number: M220711	**Pending**	**NO** ●
4.3 Vaccine Trial	**Yes** Clearance Number: M220711	**Pending**	**NO** ●
4.4 Is conducted in a village led by tribal authority?	**Yes** Date tribal authority engaged:	**Not Applicable**	**NO** ●

Please note that this letter is not an approval to undertake a study, but a support letter from identified facility/district. i.e. the CEO/District Manager acknowledges to have been consulted on the study

5 Declaration

Declaration by Applicant:

I Mr/Ms/Dr/Prof/Adv. Panashe Marble Furusa agree to submit/present the result of this study back to the CEO/Institution/District.

Estimated date of feedback: 31-Dec-23

To be signed by a relevant CEO/District Manager/Programme Manager/Senior Manager in Mpumalanga Province

Supported / Not Supported See attached letter of Delegation

Signature: [signature] Date: 29.03.2023

Name: Dr KA Mwimba

Stamp

A duly signed form can be uploaded on the **nhrd** website by the researcher or emailed to: JerryS@mpuhealth.gov.za or ThembaM@mpuhealth.gov.za

Please note that this letter is not an approval to undertake a study, but a support letter from identified facility/district i.e. the CEO/District Manager acknowledges to have been consulted on the study

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c/o Bologna and Lauzanne Street Evander, 2280, Mpumalanga
Private Bag X1005, Evander, 2280, Mpumalanga Province
Tel I. 017 6322127/8,int:+27 17 6322127/8, Fax:017 6322222, int+2717 6322222

Litiko Letemphilo | Departement van Gesondheid | UmNyango WezeMaphilo

TO : **DR KA MWIMBA**
CLINICAL MANAGER
EVANDER HOSPITAL

FROM : **MS MG NDLOVU**
CHIEF EXECUTIVE OFFICER
EVANDER HOSPITAL

DATE : **24 MARCH 2023**

SUBJECT : **DELEGATION AS ACTING CHIEF EXECUTIVE OFFICER: EVANDER HOSPITAL**

1. The above matter refers:
2. This letter serves to delegate you as Acting Chief Executive Officer for Evander Hospital from the 27th March to 14th April 2023.
3. You are expected to execute all duties of the Chief Executive Officer.
4. As an accountable official of the Department, I trust that you will perform your tasks with diligence and necessary urgency and thoroughness it requires.
5. In case of any urgent matters you can contact me on my cellphone (071 685 4814)

Thanking you in advance.

MS MG NDLOVU
CHIEF EXECUTIVE OFFICER
EVANDER HOSPITAL

24/03/2023
DATE

ACCEPTED/NOT ACCEPTED

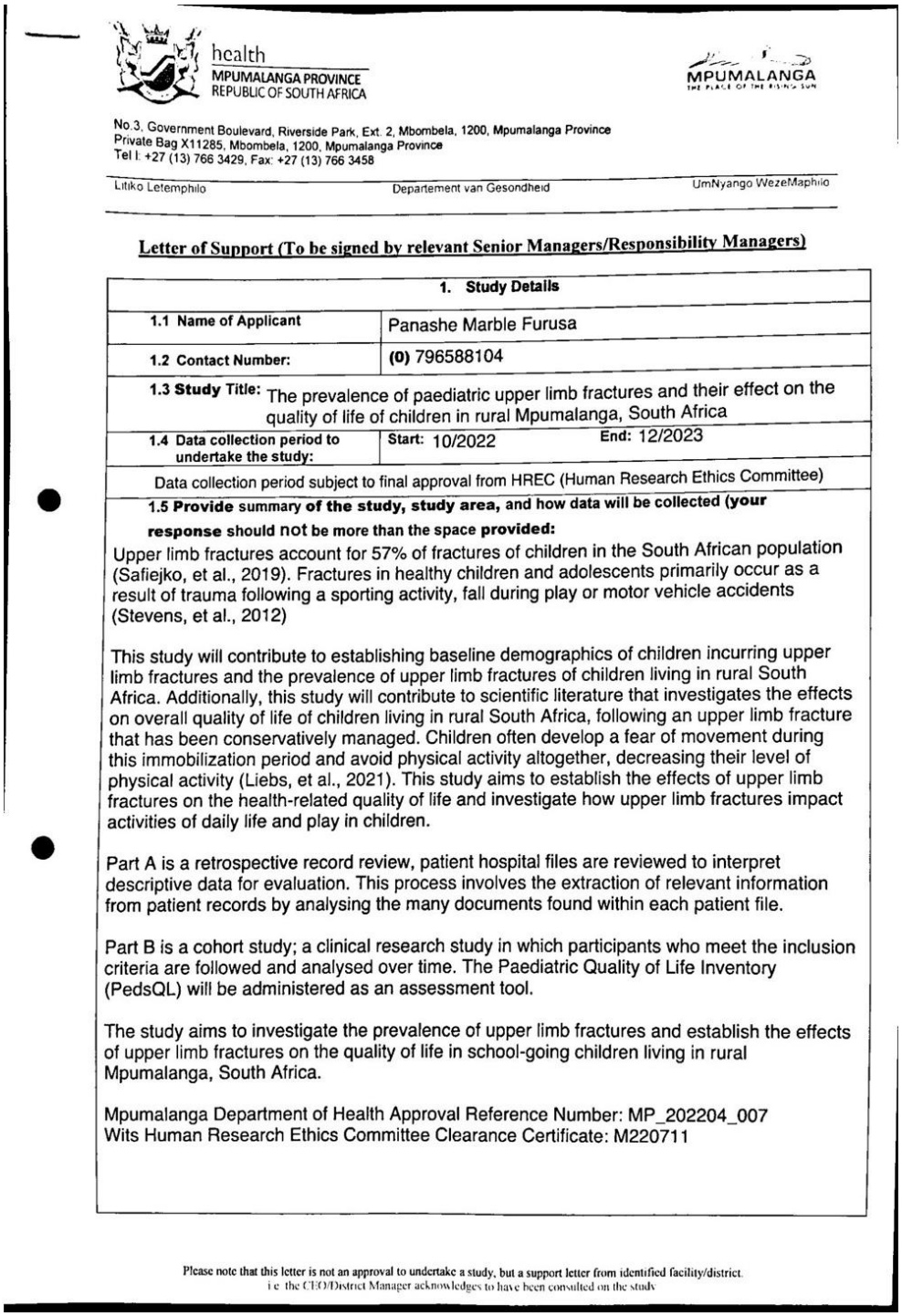
I KA MWIMBA hereby accept / Not accept the delegation as Acting Chief Executive Officer for Evander hospital from the 27th March to 14th April 2023.

DR KA MWIMBA
MEDICAL MANAGER: EVANDER HOSPITAL

27.03.2023
DATE

MPUMALANGA
THE PLACE OF THE RISING SUN

Appendix 7E- Letter of Support (Witbank Hospital)



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Private Bag X11285, Mbombela, 1200, Mpumalanga Province
Tel I: +27 (13) 766 3429, Fax: +27 (13) 766 3458

Litiko Letemphilo | Departement van Gesondheid | UmNyango WezeMaphilo

Letter of Support (To be signed by relevant Senior Managers/Responsibility Managers)

1. Study Details	
1.1 Name of Applicant	Panashe Marble Furusa
1.2 Contact Number:	(0) 796588104
1.3 Study Title:	The prevalence of paediatric upper limb fractures and their effect on the quality of life of children in rural Mpumalanga, South Africa
1.4 Data collection period to undertake the study:	Start: 10/2022 End: 12/2023
Data collection period subject to final approval from HREC (Human Research Ethics Committee)	

1.5 Provide summary of the study, study area, and how data will be collected (your response should not be more than the space provided:

Upper limb fractures account for 57% of fractures of children in the South African population (Safiejko, et al., 2019). Fractures in healthy children and adolescents primarily occur as a result of trauma following a sporting activity, fall during play or motor vehicle accidents (Stevens, et al., 2012)

This study will contribute to establishing baseline demographics of children incurring upper limb fractures and the prevalence of upper limb fractures of children living in rural South Africa. Additionally, this study will contribute to scientific literature that investigates the effects on overall quality of life of children living in rural South Africa, following an upper limb fracture that has been conservatively managed. Children often develop a fear of movement during this immobilization period and avoid physical activity altogether, decreasing their level of physical activity (Liebs, et al., 2021). This study aims to establish the effects of upper limb fractures on the health-related quality of life and investigate how upper limb fractures impact activities of daily life and play in children.

Part A is a retrospective record review, patient hospital files are reviewed to interpret descriptive data for evaluation. This process involves the extraction of relevant information from patient records by analysing the many documents found within each patient file.

Part B is a cohort study; a clinical research study in which participants who meet the inclusion criteria are followed and analysed over time. The Paediatric Quality of Life Inventory (PedsQL) will be administered as an assessment tool.

The study aims to investigate the prevalence of upper limb fractures and establish the effects of upper limb fractures on the quality of life in school-going children living in rural Mpumalanga, South Africa.

Mpumalanga Department of Health Approval Reference Number: MP_202204_007
Wits Human Research Ethics Committee Clearance Certificate: M220711

Please note that this letter is not an approval to undertake a study, but a support letter from identified facility/district i.e. the CEO/District Manager acknowledges to have been consulted on the study

2. Resources Required from Facility/Sub-district/Community		
2.1 Facility Staff Required to assist with the Study	Yes ●	NO
	How many: Nurses: 0 Doctors: 0 Space: Other, please specify: 1 Physiotherapist	
2.2 Patients / Researchers' Records/Files	Yes ● Part A (retrospective review) and Part B Year: From: 01/2019 To: 12/2023	NO
2.3 Interviewing Patients/ participants at Facilities	Yes ● From October 2022 (subject to HREC approval)	NO
2.4 Interviewing Patients/ participants at Home	Yes	NO ●
2.5 Other, please specify:	N/A	

3 Resource flow/benefits to the Provincial Department		
3.1 The research is responsive to which National/Provincial/departmental priority/strategy/research agenda. • **State your response:** - Acquiring accurate data on the prevalence and incidence of NCDs in the population through active case finding - Referral systems		
3.2 Resource Flow (Are there benefits to Patients/community)	Yes ● Please list: all potential remedial ideas emanated from research will be taken up for healthcare practice and policy To identify and address the impact on activities of daily life and play in children in order to advocate for early physiotherapy intervention and improve physical rehabilitation.	NO
3.3 Resource Flow (Are there benefits to Facility/District)	Yes ● Please list: to create a linkage between all research stakeholders The findings of the study aim to improve the referral pathways of physiotherapy intervention in children with simple upper limb fractures in the facility and improve physiotherapy management of the condition.	NO

4 Availability of Required Clearance/s			
4.1 Ethical Clearance	Yes ● Clearance Number: M220711	Pending	NO
4.2 Clinical Trial	Yes Clearance Number: M220711	Pending	NO ●
4.3 Vaccine Trial	Yes Clearance Number: M220711	Pending	NO ●
4.4 Is conducted in a village led by tribal authority?	Yes Date tribal authority engaged:	Not Applicable	NO ●

Please note that this letter is not an approval to undertake a study, but a support letter from identified facility/district i.e. the CEO/District Manager acknowledges to have been consulted on the study

5 Declaration

Declaration by Applicant:

I Mr/Ms/Dr/Prof/Adv. Panashe Marble Furusa agree to submit/present the result of this study back to the CEO/Institution/District.

Estimated date of feedback: 31-Dec-23

To be signed by a relevant CEO/District Manager/Programme Manager/Senior Manager in Mpumalanga Province

Supported / Not Supported

To present the results to the facility

Signature: _____ **Date:** 21/March/2023

Name: KAP Madonsela

DEPARTMENT OF HEALTH
WITBANK HOSPITAL
OFFICE OF THE CEO
2023 03 30
PRIVATE BAG X7612 WITBANK
MPUMALANGA PROVINCE

A duly signed form can be uploaded on the nhrd website by the researcher or emailed to: JerryS@mpuhealth.gov.za or ThembaM@mpuhealth.gov.za

Please note that this letter is not an approval to undertake a study, but a support letter from identified facility/district. i e the CEO/District Manager acknowledges to have been consulted on the study

Appendix 8: Participant Financial Reimbursement Form

CONFIRMATION OF FINANCIAL REIMBURSEMENT

Study title: The point prevalence of paediatric upper limb fractures and their effect on the quality of life of children in rural Mpumalanga, South Africa

Reimbursements for "out of pocket" expenses will be covered for transportation for the initial assessment at R30.00 per return-trip for the participant and R30.00 per return-trip for the guardian. A light refreshment will be served during the initial and follow-up assessment. Time involved will be the predominant cost, but there will be no further payment or cost associated with participation as scheduled research participation follow-up dates will be scheduled to coincide with routine physiotherapy appointments.

Contact details of researcher/s:

• Panashe Furusa (Principal Investigator)
Telephone: +27796588104
E-mail: nashefurusa@gmail.com

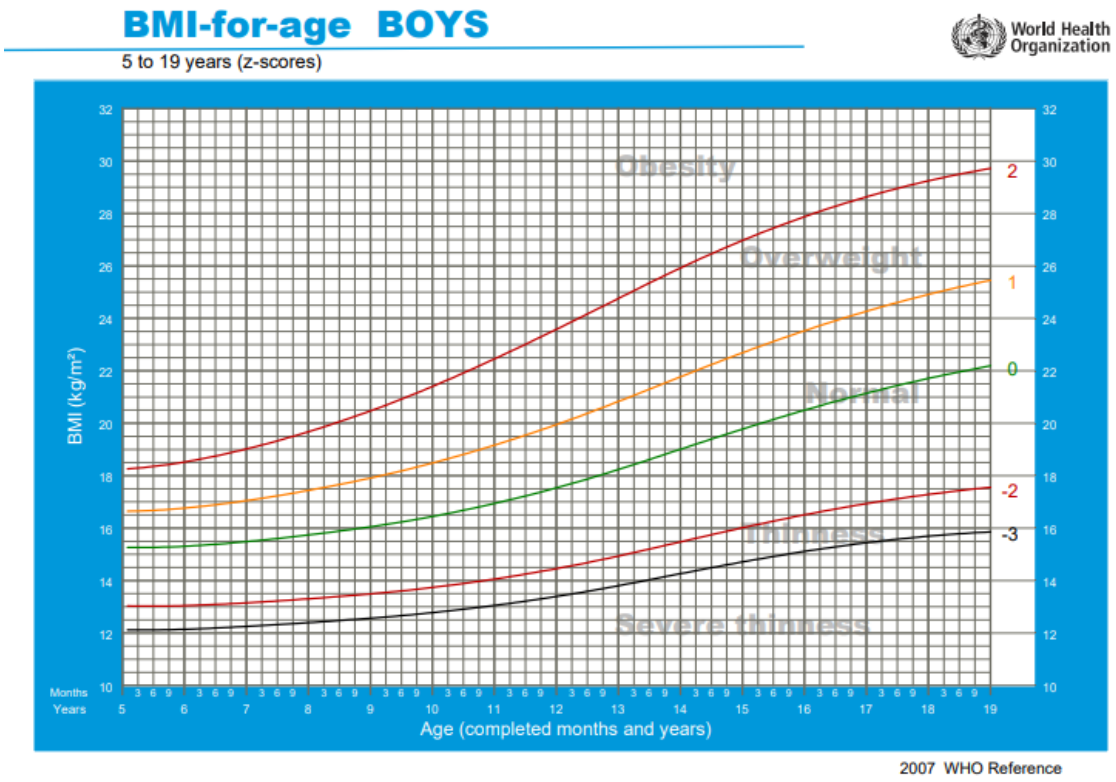
• Dr Natalie Benjamin-Damons (Supervisor)
Email: natalie.benjamin-damons@wits.ac.za

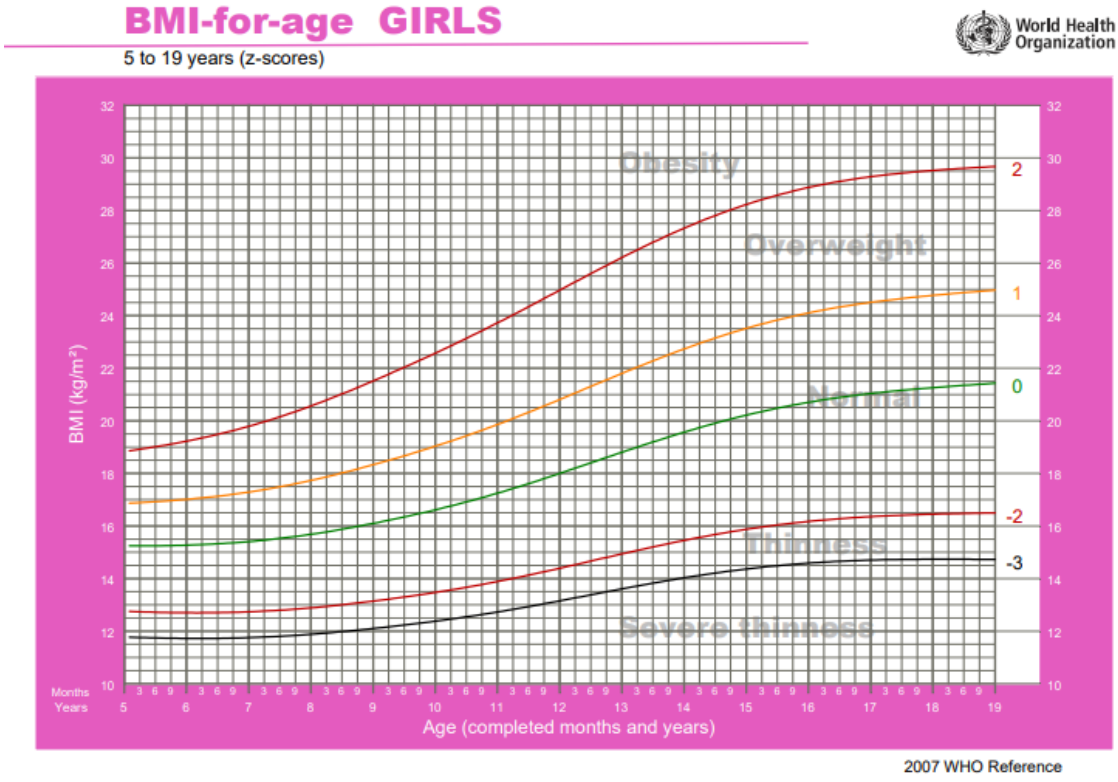
I _____ (caregiver) of the child participant _____ (name of participant) hereby confirm that I have received the financial reimbursement as stipulated in the information document.

Date: _____

Signature: _____

Appendix 9: WHO Body Mass Index Charts





Appendix 10: Approval of Title

UNIVERSITY OF THE WITWATERSRAND, JOHANNESBURG

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

Reference: Mrs Sandra Benn
E-mail: sandra.benn@wits.ac.za

15 March 2022
Person No: 1354488
PAG

Miss P Furusa
4
Levubu Avenue
Peninapark
0699
South Africa

Dear Miss Panashe Furusa

Master of Science in Physiotherapy: Approval of Title

We have pleasure in advising that your proposal entitled *The prevalence of paediatric upper limb fractures and their effect on the quality of life of children in rural Mpumalanga, South Africa* has been approved. Please note that any amendments to this title have to be endorsed by the Faculty's higher degrees committee and formally approved.

Yours sincerely

Mrs Sandra Benn
Faculty Registrar
Faculty of Health Sciences

Appendix 11: Mpumalanga Provincial Health Research and Ethics Committee Certificate

health
MPUMALANGA PROVINCE
REPUBLIC OF SOUTH AFRICA

Indwe Building, Government Boulevard, Riverside Park, Ext. 2, Mbombela, 1200, Mpumalanga Province
Private Bag X11285, Mbombela, 1200, Mpumalanga Province
Tel I: +27 (13) 766 3429, Fax: +27 (13) 766 3458

Litiko Letemphilo | Departement van Gesondheid | UmNyango WezeMaphilo

Enq: 013 766 3766
Ref: MP_202204_007

MPUMALANGA PROVINCE
DEPARTMENT OF HEALTH
21 -08- 2023
PRIVATE BAG X11285
NELSPRUIT 1200

Research Permission Letter

MS P FURUSA
4 LEVUBU AVENUE
POLOKWANE, 0699

STUDY TITLE: ***THE PREVALENCE OF PAEDIATRIC UPPER LIMB FRACTURES AND THEIR EFFECT ON THE QUALITY OF LIFE OF CHILDREN IN RURAL MPUMALANGA, SOUTH AFRICA***

Dear Ms Furusa

The Mpumalanga Provincial Health Research and Ethics Committee (MPHREC) has approved your research proposal in the latest format you sent, and hereby grant you permission to conduct your research as detailed below.

- **Approval Reference Number:** **MP_202204_007**
- **Data Collection Period:** **15 November 2022 - 30 December 2024**
- **Approved Data Collection Facilities:** **Amajuba Memorial Hospital, Bernice Samuel Hospital, Bethal Hospital, Evander Hospital & Witbank Hospital**

Kindly ensure that conditions mentioned below are adhered to, and that the study is conducted with minimal disruption and impact on our staff, and also ensure that you provide us with a soft or hard copy of the report once your research project has been completed.

Conditions:
- *Researchers not allowed to make copies, take pictures of medical records or administer medicine to patients at the facility.*
- *Kindly notify the facility manager* ***a week BEFORE*** *you start with data collection to ensure that conditions are conducive in the facility.*
- *The FINAL RESEARCH FINDINGS must be uploaded on the NHRD website*

Kind regards

DR J SIGUDLA
MPHREC SECRETARIAT
DATE: 21/08/2023

MPUMALANGA

Appendix 12: Original University of the Witwatersrand Human Research Ethics Committee (Medical) Certificate

UNIVERSITY OF THE WITWATERSRAND, JOHANNESBURG

R14/49 Miss Panashe Marble Furusa

HUMAN RESEARCH ETHICS COMMITTEE (MEDICAL)

CLEARANCE CERTIFICATE NO. M220711

NAME: (Principal Investigator)	Miss Panashe Marble Furusa
DEPARTMENT:	Physiotherapy Volksrust, Mpumalanga
PROJECT TITLE:	*The prevalence of paediatric upper limb fractures and their effect on the quality of life of children in rural Mpumalanga, South Africa*
DATE CONSIDERED:	29/07/2022
DECISION:	Approved conditionally
CONDITIONS:	Provide permission letter from the Mpumalanga province research ethics committee to HREC (Medical) before data collection commences. No data may be collected until the approval letter is received and unconditional approval is issued
SUPERVISOR:	Dr Natalie Benjamin-Damons
APPROVED BY:	Dr CB Penny, Chairperson, HREC (Medical)
DATE OF APPROVAL:	20/10/2022

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

DECLARATION OF INVESTIGATORS

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

Principal Investigator Signature Date

PLEASE QUOTE THE PROTOCOL NUMBER IN ALL ENQUIRIES

Appendix 13: Amended University of the Witwatersrand Human Research Ethics Committee (Medical) Certificate

UNIVERSITY OF THE WITWATERSRAND JOHANNESBURG

R49 Ms PM Furusa

HUMAN RESEARCH ETHICS COMMITTEE (MEDICAL)
CLEARANCE CERTIFICATE NO. M220711

NAME: (Principal Investigator)	Ms PM Furusa
DEPARTMENT:	School of Therapeutic Sciences Department of Physiotherapy Medical School University
PROJECT TITLE:	*The prevalence of paediatric upper limb fractures and their effect on the quality of life of children in rural Mpumalanga, South Africa*
DATE CONSIDERED:	2022/07/29
DECISION:	Approved unconditionally
CONDITIONS:	This approval applies only to the study sites listed in Annex 1 attached Further sites may be added on presentation of evidence of management approval to the HREC (Med)
NOTE:	If contact information regarding student study participants is required, please contact the Registrar's office - <Nicoleen.Potgieter@wits.ac.za>
SUPERVISOR:	Dr N Benjamin-Damons
APPROVED BY:	Professor P Ruff, Chairperson, HREC (Medical)
ORIGINAL APPROVAL DATE:	2022/10/20 **EXPIRY DATE:** 2027/10/19

This Clearance Certificate is valid for 5 years from the date of approval. An extension may be applied for.

DECLARATION OF INVESTIGATORS

To be completed in duplicate and **ONE COPY** returned to the Research Office secretariat on the 3rd floor, Phillip Tobias Building, Parktown, University of the Witwatersrand, Johannesburg.

I/we fully understand the conditions under which I am/we are authorized to carry out the above-mentioned research and I/we undertake to ensure compliance with these conditions. Should any departure be contemplated from the research protocol as approved, I/we undertake to submit details to the Committee. **I agree to submit a yearly progress report**. When a funder requires annual re-certification, the application date will be one year after the date when the study was initially reviewed. In this case, the study was initially reviewed in **July** and therefore reports and re-certification will be due in the month of **July** each year. Unreported changes to the study may invalidate the clearance given by the HREC (Medical).

Signature of Principal Investigator Date

Annex 1

Protocol No. M22/07/11 **Ms PM Furusa**

Study title: *The prevalence of paediatric upper limb fractures and their effect on the quality of life of children in rural Mpumalanga, South Africa*

Study sites approved under this Clearance Certificate

Hospital sites	Date of HREC (Med) Approval
Amajuba Memorial Hospital	2022/10/20
Bernice Samuel Hospital	2023/09/07
Bethal Hospital	2023/09/07
Evander Hospital	2023/09/07
Witbank Hospital	2023/09/07

Professor P Ruff
Chairperson: HREC (Medical)
University of the Witwatersrand, Johannesburg

Date: 07 September 2023

Appendix 14: Original Protocol

Research Protocol

The point prevalence of paediatric upper limb fractures and their effect on the quality of life of children in rural Mpumalanga, South Africa.



UNIVERSITY OF THE WITWATERSRAND, JOHANNESBURG

Panashe Furusa
1354488
Master of Science in Physiotherapy (Dissertation)
Department of Physiotherapy
University of the Witwatersrand, Johannesburg

Supervised by Dr Natalie Benjamin-Damons

List of Abbreviations

AMH - Amajuba Memorial Hospital
HRQoL - Health Related Quality of Life
PedsQL - Paediatric Quality of Life Inventory

Background

The incidence of fractures in the paediatric population are estimated as equal to those of the elderly population. Upper limb fractures account for 57% of fractures of children in the South African population (Safiejko, et al., 2019). Maggio et. al, stated that the most common long bone fractures in the paediatric population occur in the forearm, accounting for 40% of all paediatric fractures. Fractures in healthy children and adolescents primarily occur as a result of trauma following a sporting activity, fall during play or motor vehicle accidents (Stevens, et al., 2012).

Fracture classification

A fracture is classified as a simple fracture when the skin overlying the fracture site is unbroken and the bone is unexposed to the air (Thandrayen, et al., 2008). Diaphyseal fractures are classified as either simple fractures (type A), wedge fractures (type B) or multi-fragmentary fractures (type C). Simple fractures are further classified as spiral fractures, oblique fractures (fracture line greater than or equal to 30 degrees to a line perpendicular to the long axis of the bone) or transverse fractures (fracture line less than 30 degrees to a line perpendicular to the long axis of the bone) (Thandrayen, et al., 2008). End segment fractures are classified as extra articular (type A), partial articular (type B) or complete articular (type C). Extra articular fractures are further classified as simple, avulsion or multi-fragmentary (Thandrayen, et al., 2008). In this study, particular focus will be placed on simple fractures that are treated conservatively with cast immobilisation (Ceroni, et al., 2011).

Immobilization

Cast immobilization is predominantly used in the conservative management of fractures in all age populations. Casts are applied for approximately four to 12 weeks depending on the degree of the fracture. However, adequate callus formation is often the main criteria for removal. Callus formation is described as the bony deposit between and around the broken ends of the bone fractures during normal healing (Thandrayen, et al., 2008).

Cast immobilization is often associated with a decrease in physical activity, substantial muscle atrophy and bone tissue loss due to the cast's size, weight, length imitations of movement (Ceroni, et al., 2011). Furthermore, decreased joint range of motion, muscle atrophy and muscle shortening are common presentations after cast removal. Decreased physical activity is synonymous with sedentary and technologically enhanced activities such as television watching and computer games (Ceroni, et al., 2011).

However, children in rural Southern Africa are often not exposed to technological devices mostly relying on active physical play as their main form of interaction (Liebs, et al., 2021). Therefore, it is important to establish the effects of immobilization on their health-related quality of life (Randsborg & Rotterud, 2016).

Additionally, rural communities have limited access to health care facilities with services to facilitate adequate rehabilitation during the immobilization period. Children often develop a fear of movement during this immobilization period and

avoid physical activity altogether, decreasing their level of physical activity (Liebs, et al., 2021). Therefore, it is essential to investigate the overall effect of decreased physical activity following an upper limb fracture on the health-related quality of life in children living in a rural South African setting.

Health-related quality of life

The health-related quality of life (HRQoL) is a multi-dimensional concept that includes domains related to physical, mental, emotional, and social functioning (Davis, et al., 2006). Well-being is the central concept, assessing the positive aspects of life, emotion, and satisfaction (Davis, et al., 2006) (Loprinzi & Cardinal, 2011). Therefore, the investigation of the health-related quality of life is essential to understanding the well-being of the paediatric population following traumatic upper limb fracture and immobilization in relation to physical activity limitations (Kenzik, et al., 2015) (Stevens, et al., 2012).

Active play significantly contributes to more holistic wellness of children in comparison to digital entertainment in the form of video games and television watching (Anderson-McNamee, 2010). Play helps with the development of fine and gross motor skills. Active play allows development of the imagination, dexterity, physical, cognitive, and emotional aspects of children (Anderson-McNamee, 2010).

HRQoL Outcome Measure: Paediatric Quality of Life Inventory (PedsQL)

The Paediatric Quality of Life Inventory 4.0 Generic Core Scales (PedsQL) is an appropriate tool that can be used to measure quality of life in children based on their health. This tool is a multidimensional self-report instrument that can be used in children and adolescents between five and 18 years (Pedsql.com, 2021). The questionnaire includes 23-items which encompass: physical functioning (eight items), emotional functioning (five items), social functioning (five items), and school functioning (five items). The instructions ask how much of a problem each item has been during the last month (Pedsql.com, 2021). It includes both a self-report and parent proxy-report. The self-report format includes ages five to seven, eight to 12, and 13 to 18 (Kenzik, et al., 2015).

This outcome measure has been reported to represent an advancement in paediatric health related quality of life measurement as it combines reliability, validity, responsiveness, and practicality that is often rare in a single paediatric quality of life instrument (Kenzik, et al., 2015)

Problem Statement

There is very little research investigating the point prevalence of upper limb fractures and the effect of upper limb fractures on the health-related quality of life in school-going children living in rural Mpumalanga, South Africa.

Children in rural Southern Africa predominantly engage in active physical play as their main form of interaction and play (Anderson-McNamee, 2010). Therefore, the

impact of decreased physical activity and play due to upper limb fractures on health-related quality of life is important for investigation (Liebs, et al., 2021).

Significance of the Study

Previous studies and literature outline the effects of upper limb fractures on physical activity levels (Stevens, et al., 2012). However, there are no known studies that investigate the effects on overall quality of life of children living in rural Southern Africa, following an upper limb fracture that has been conservatively managed.

Furthermore, this study will contribute to establishing baseline demographics of children incurring upper limb fractures and the point prevalence of upper limb fractures of children living in rural South Africa

Additionally, this study will contribute to scientific literature that investigates the effects on overall quality of life of children living in rural South Africa, following an upper limb fracture that has been conservatively managed. Children often develop a fear of movement during this immobilization period and avoid physical activity altogether, decreasing their level of physical activity (Liebs, et al., 2021).

This study aims to establish the effects of simple upper limb fractures on the health-related quality of life and investigate how simple upper limb fractures impact activities of daily life and play in children to advocate for early physiotherapy intervention for children with low physical functioning in the form of decreased range of motion, decreased strength and/or decreased physical activity. Additionally, the findings of the study aim to improve the referral pathways of physiotherapy intervention in children with simple upper limb fractures with low physical functioning scores.

Research Question

What is the point prevalence of upper limb fractures and their effect on the health-related quality of life in children living in rural Mpumalanga, South Africa?

Aim of the Study

To investigate the point prevalence of simple upper limb fractures and establish the effects of upper limb fractures on the quality of life in children aged five to 17 living in rural Mpumalanga, South Africa.

Objectives of the Study

- To establish baseline demographics of children incurring simple upper limb fractures in rural Mpumalanga, South Africa.
- To investigate the point prevalence of simple upper limb fractures of children living in rural Mpumalanga, South Africa.

- To compare the body mass index of children sustaining simple upper limb fractures to children with statistical body mass index values of children according to WHO.
- To investigate the health-related quality of life of children with simple upper limb fractures during the cast-immobilization stage of upper limb fracture recovery.

Methodology

Type of Study

Part A is a retrospective record review, patient hospital files are reviewed to interpret descriptive data for evaluation. This process involves the extraction of patient information from patient records of children aged five to ten diagnosed through x-rays with traumatic simple upper limb fractures. Part A will provide statistical background regarding the type of injury, cause of injury and place of point prevalence of the simple upper limb fractures in children aged five to 18 within the community. Additionally, the sample size of a minimum of 300 children will have a 90% power part A of the study.

Part B is a descriptive study; a clinical research study in which children aged five to 17 who presently have simple upper limb fractures are assessed using the PedsQL.

This study is to be conducted at Amajuba Memorial Hospital, Volksrust, Pixley Ka Seme Municipality in the Mpumalanga province.

Participants

Part B:

Children living in rural Mpumalanga who have access to the hospital, and are currently being treated and receiving rehabilitation at Amajuba Memorial Hospital will be invited to participate in the study. These children will be identified through hospital records and admission. The children who meet the inclusion criteria will be invited to participate in the study. The primary caregivers of these children will be approached for consent on a date when the child has an appointment for medical management and physiotherapy rehabilitation. If consent and assent are given (Appendix 1 & 2), and the child fits the inclusion criteria, they will be included in the study, assessed on this date or their next scheduled appointment and given the information needed to participate in the study. The participants will be informed and booked for participation in the study for data collection on the day of their scheduled physiotherapy rehabilitation follow-up.

Inclusion Criteria

- Children of school-going age with simple and single upper limb fractures of the humerus, radius or ulnar
- Children with no previous history of upper limb and/or lower limb fractures

- Children medically managed conservatively with immobilization casts
- Children aged five to 17 years old

Exclusion Criteria

- Children with chronic medical conditions/illnesses

Sample Size

Data from an earlier study using the PedsQL to measure health related quality of life after conservatively and surgically treated paediatric fractures used a mean value of 92.8 for simple humerus fracture (Liebs, et al., 2021) to ensure that the calculated sample size would provide sufficient statistical power (Liebs, et al., 2021).

Using the PedsQL as the primary outcome measure, a sample size of a minimum of 86 children will have a 90% power to detect a three-point change (ages five to seven), five-point change (ages eight to 12) and five-point change (ages 13 to 18) in the health-related quality of life scores with a standard deviation of one, at a level of significance of 0.05. Therefore, in consideration of the potential drop-out rate, the sample size will consist of 90 participants.

Instrumentation and Outcome Measures

Table 1: Outcome Measures and Description

Outcome Measure	**Description**
PedsQL 4.0 Generic Core Scales	This is a 23-item assessment questionnaire tool which evaluates the health-related quality of life (HRQOL) in children who are healthy and children with acute and chronic conditions. PedsQL looks at four scales - physical functioning (8 items), emotional functioning (5 items), social functioning (5 items) and school functioning (5 items). This will give us an overview of the participants' quality of life and the effects it has on their physical activity. The University of the Witwatersrand Department of Physiotherapy has obtained permission and license to utilise the PedsQL for clinical practice and research.
Digital Body Weight Scale	A device for measuring weight, often of a person. Balances measure the mass of an object and are used in science to obtain the mass of an object.

Stadiometer	A piece of medical equipment used for measuring human height. It is usually constructed out of a ruler and a sliding horizontal headpiece which is adjusted to rest on top of the head.

Procedure

Part A:
The point prevalence of upper limb fractures will be investigated and established. This investigation process will involve the extraction of patient information from patient records of children aged five to ten diagnosed through x-rays with traumatic simple upper limb fractures.

A retrospective review of all paediatric patients with upper limb fractures over the January 2019 to August 2022 period will be done by the researcher. The time period will allow for a significant number of patient files & cases to be collected and analysed.

All the hospital files under the casualty, orthopaedic and physiotherapy departments will be surveyed. Data will be captured electronically and inserted into STATA (Stata Corp, USA) a statistical software for data science and analysis. The data will look at hospital statistics regarding the point prevalence of paediatric simple upper limb fractures, types of fractures, cause of injury, place of injury, gender, and age at time of injury. (Kamil Safiejko, 2019)

Table 2: Part A Data Collection

Participant number:	Bone fracture (humerus, ulnar/radius):	Type of fracture:	Gender (male/female):	Age at injury:	Cause of injury (fall during play, motor vehicle accident, sport/ assault)	Place of injury (home, school, public place/road traffic)
1.						

Part B:
The data collection period is expected to span from October 2022 (pending Human Research Ethics Committee approval) August 2023 for PedsQL assessments (Part B).

The principal investigating physiotherapist will travel to the data collection site twice each month on the dates that majority of the participants have been scheduled for medical and/or physiotherapy rehabilitation at Amajuba Memorial Hospital as communicated by the resident physiotherapists through communication with the potential participants' guardians.

Participants will be invited to participate in the study, and given participant information sheets and consent forms. Assent forms will be given to the children and explained thoroughly by the principal investigator. Upon consent and assent, these participants will have their height and weight taken by the investigating physiotherapist and captured on the data sheet on the day of their assessment. The PedsQL is a detailed outcome measure (discussed below) and will be administered by the investigating physiotherapist who has been trained on the use of the PedsQL.

The guardians will receive education and the PedsQL testing procedure will be explained to the caregiver and children beforehand.

The language population of Volksrust, Mpumalanga consists of 72.38% isiZulu, 15.77% Afrikaans and 4.41% English speakers (Department of Statistics South Africa, 2011). PedsQL is available in all three of these main languages, isiZulu, Afrikaans, and English. An isiZulu and/or Afrikaans translator will be requested to join the investigation to assist with translation during the assessment.

The guardians will be present during assessment and will fill in the questionnaire on behalf of children aged five to seven. However, the children aged eight to 17 will fill in their own questionnaires with the supervision of the caregiver. The participants' anthropometric measures (weight and height) and PedsQL scores will be recorded in the data collection sheet by the investigator.

Furthermore, participants will be contacted for re-assessment after six weeks, after their immobilization cast is removed, the follow-up re-assessment will be booked on the day they are scheduled for routine physiotherapy rehabilitation as communicated by the resident physiotherapist. The remodelling phase occurs when the hard callus is reabsorbed by the osteoclasts and deposited by the osteoblasts, this process occurs after three to four weeks (Liebs, et al., 2021). A follow-up assessment will be administered using the PedsQL during their follow-up assessment.

PedsQL Testing Procedure:

Upon the arrival of the participant and guardian on the day of testing the reason, rules of the questionnaire and possible outcomes of the PedsQL will be explained. The investigator will also answer queries that may be raised prior to starting the questionnaire. The general protocol of PedsQL will be followed as stipulated in the administration guidelines (Pedsql.org, 2021) in the appendix session. The investigator will provide clarification, and translation by the resident physiotherapists a needed while complying with the administration guidelines in the appendix section.

Ethical Consideration

Approval

Ethical considerations will be collected from the WITS Human Research Ethics Committee (Medical). Permission will be obtained from the WITS Department of Physiotherapy, WITS Faculty of Health Science, Mpumalanga Department of Health, and the CEO of Amajuba Memorial Hospital (Mr Mkhaliphi).

Confidentiality

The Declaration of Helsinki (DoH) ethical guidelines will be adhered to, as participants' anonymity and confidentiality will be highly prioritised (World Medical Association (WMA), 2009). This will be through numerical participant numbers being used for identification and information sheets with separate consent forms will be distributed to primary caregivers of the selected children. Personal information will be treated in the strictest confidence and personal information will only be available to the Principal Investigator and her supervisor, in the case wherein the principal investigator is a postgraduate student.

The only exceptions - and all of them are rare - would normally be:

1. Personal information may be disclosed if required by law
2. The Human Research Ethics Committees of the University may exceptionally require personal data to respond to a formal complaint, or for a compliance audit

Consent

Informed consent by the guardian of the participant will be needed to include the child in the study. An information sheet with separate consent forms will need to be signed. Participants will be requested to give assent to participation in the study. The participant will only be enrolled into the study upon obtaining both consent and assent.

Data Analysis

Information retrieved will be captured electronically, using the Red-Cap system and uploaded onto a password-protected computer device. RedCap is (POPI) compliant, and all personal identifiers will be hidden. Access to the physical and electronic data will be restricted solely to the investigator and research supervisor.

Table 3: Data Analysis Presentation

Study Objectives	**Type of Data**	**Statistical Tests**
To establish baseline demographics of children incurring simple upper limb fractures in rural Mpumalanga, South Africa	Nominal data	Not applicable, group the children in accordance with their age and gender.
To investigate the point prevalence of simple upper limb fractures of children living in rural Mpumalanga, South Africa	Numerical, Discrete data	Not applicable, determine the total number of children with upper limb fractures and conclude on the point prevalence.
To compare the body mass index of children sustaining simple upper limb fractures to children with statistical body mass index values of children by WHO	Numerical, continuous data	Z-test, comparing the height, weight, and body mass index.
To compare the health-related quality of life of children with simple upper limb fractures during the cast-immobilization stage of upper limb fracture recovery	Ordinal data	Paired T-test, comparing the effect of cast-immobilization on the health-related quality of life in the children with upper limb fractures.

Data will be captured electronically from RedCap to STATA (Stata Corp, USA) a statistical software for data science and analysis. Backups of the data will be made to ensure safety and secure storage of data. The researcher will compare and analyse the data collected.

Part A:
Descriptive statistics will be used to analyse this data. This will characterize the shape, central tendency and variability within the data collected from the three groups with the intention of describing the population represented by the two groups. As we are dealing with ordinal data, measures of central tendency specifically, median, and mean scores will be used.

Part B:
The data obtained from the PedsQL study will be analysed based on how many individuals fall under which percentile and looking at the mean and mode, to determine the presence of a statistical or significant difference. The ANOVA (Analysis of Variance Test) is a hypothesis test that aims to assess the significance of the hypothesis proposed in the study. This analysis tool will be utilised for data analysis.

Additionally, the Z test will be used to establish the differences in the results by looking at the means of the scores. The Paired T test aims to look at matched entries and compare the means of the initial assessment and follow-up re-assessment scores to establish if there is a difference.

Time Frame of the Project

Table 4: Time Frame

2021	July	Aug	Sep	Oct	Nov	Dec
Literature Review	X					
Research Protocol Preparation	X	X				
Research Protocol Draft		X	X	X		
Research Protocol Assessment					X	X

2022	Jan	Feb	Mar	Apr	May	Jun	July	Aug	Sep	Oct	Nov	Dec
Ethics Application					X	X	X	X	X	X		
Data Collection (Subject to HREC final approval)										X	X	X

2023	Jan	Feb	Mar	Apr	May	Jun	July	Aug	Sep	Oct	Nov
Data Collection	X	X	X	X	X	X	X	X			
Data Analysis								X			
Write Up - Thesis & Paper								X	X	X	X
Submission										X	X

Budget & Funding

Table 5: Budget

Category	Description	Cost
Printing	Information Sheets Informed Consent Documentation PedsQL Administration Guidelines PedsQL Score Sheets Dissertation Printing Dissertation Binding	R1000.00
Stadiometer	Medical equipment for measuring human height	R800.00
Digital Body Weight Scale	Medical equipment for measuring human weight	R200.00
Stationery	Pens & Pencils	R200.00
Participation Reminders	2 x 90 Vodacom SMSs at R0.50	R90.00
Refreshments for participants	Oros Juice and biscuits (90 participants at R50 each)	R4500.00
Transportation for participants	Taxi fare at R30 per return trip x 2	R5400.00
Transportation for data collection	230km at R0.82 for 36 trips (bi-weekly for 9 months)	R6789.60
		R18 979.60 (Total)

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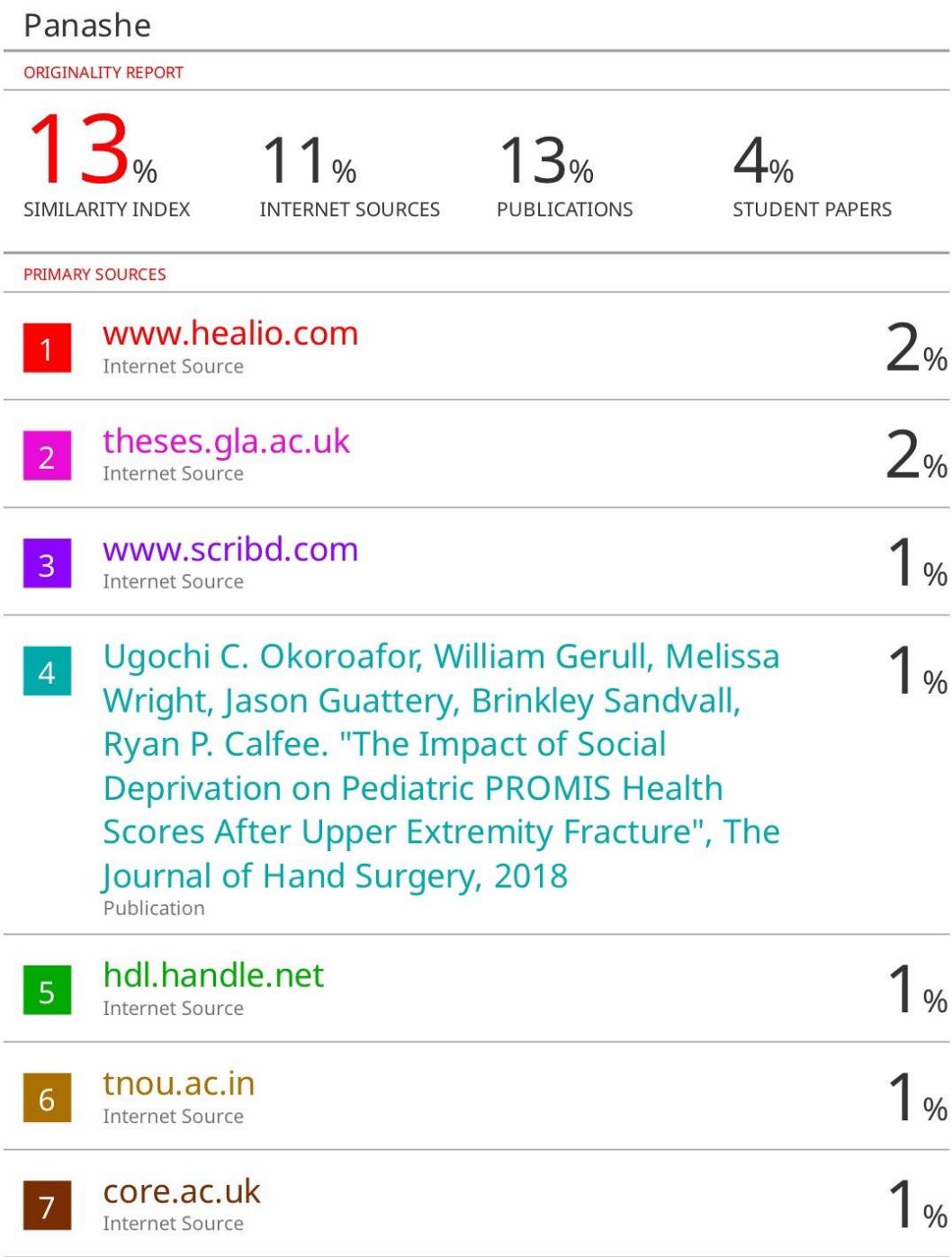
Appendix 15: Turn-It-In



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