

Perspectives of Spinal Health in School-going Children and Adolescents in the Langeberg Municipal District of South Africa: a Qualitative Study



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Declaration

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Réna Kriel

Abstract

Background: In order to improve the effectiveness of spinal health educational programs, in an effort to improve spinal behaviour of children and adolescents, research is needed to identify and explore the reasons why changes are stunted. To assist with the development of spinal health promotion strategies, the current perspectives and knowledge of different socio-economic societies and cultures need to be explored. **Aim:** The purpose of this study was to explore what the perspectives of learners (children and adolescents), teachers and parents/guardians were on the spinal health of learners in the Langeberg Municipal District of South Africa. **Methodology:** A descriptive qualitative case study design with an interpretative and phenomenological approach was used. Ninety-three participants were purposively sampled and participated in In-Depth Interviews (IDI's) or Focus Group Discussions (FGD's). An interview schedule guided the discussions. All IDI's and FGD's were recorded and transcribed. Analysis was done from the transcripts and inductive reasoning was used to explore the phenomena of spinal health in learners. Transcripts were coded based on initial and subsequent emerging themes. **Results:** A total of nine IDI's and 11 FDG's were conducted with 93 participants from 14 different schools. Three main themes emerged from the data: Barriers associated with self-care of spinal health; Facilitators to assist with Spinal Health and Back care; and Proposed Interventions for Spinal Health Barriers. **Conclusion:** The barriers emphasized by participants showed that there were problems with the spinal health of learners that needed to be addressed. The facilitators showed that barriers could be addressed but that the current facilitators weren't sufficient. The participants' proposed interventions gave plausible solutions to address the learners' spinal health barriers and to enhance the effectiveness of the facilitators. Clinicians and therapists should consider knowledge, behaviour and exercise when treating learners with LBP for a wholistic intervention. Further research is needed on the effectiveness of different delivery methods for different ages aimed at long term effectiveness. Future research should also focus on development and implementation of spinal health educational programs by pilot testing spinal health educational programs in South African Schools, including all grades.

Opsomming

Agtergrond: Ten einde die doeltreffendheid van werwelkolom gesondheidsopvoedingsprogramme te verbeter, in 'n poging om spinale gedrag van kinders en adolessente te verbeter, is navorsing nodig om die redes te identifiseer waarom veranderinge verstom word. Om te help met die ontwikkeling van spinaal gesondheidsbevorderingstrategieë, moet die huidige perspektiewe en kennis van verskillende sosio-ekonomiese gemeenskappe en kulture ondersoek word. **Doel:** Die doel van hierdie studie was om die perspektiewe van leerders (kinders en adolessente), onderwysers en ouers/voogde oor die spinale gesondheid van leerders in die Langeberg Munisipale Distrik van Suid-Afrika te ondersoek. **Metodologie:** 'n Beskrywende kwalitatiewe gevallestudie ontwerp met 'n interpretatiewe en fenomenologiese benadering is gebruik. Drie-en-negentig deelnemers was doelgerig gekies en het deelgeneem aan In-diepte Onderhoude (IDO) of Fokus Groep Gesprekke (FGG). 'n Onderhoud skedule het die gesprekke gelei. Alle IDO en FGG was opgeneem en getranskribeer. Analise was vanaf die transkripsies gedoen en induktiewe redenasie was gebruik om die fenomene van spinale gesondheid in leerders te ondersoek. **Resultate:** 'n Totaal van nege IDO en 11 FGG was uitgevoer wat 93 deelnemers van 14 verskillende skole ingesluit het. Drie hoof temas het uit die data na vore gekom: Hindernisse wat verband hou met selfsorg van spinale gesondheid; Fasiliteerders wat help met spinale gesondheid en rugversorging; en Voorgestelde intervensies vir spinale gesondheids hindernisse. **Gevolgtrekkings:** Die struikelblokke wat deur deelnemers beklemtoon is, het getoon dat daar probleme met die ruggesondheid van leerders was wat aangespreek moet word. Die fasiliteerders het getoon dat hindernisse aangespreek kan word, maar dat die huidige fasiliteerders nie voldoende was nie. Die deelnemers se voorgestelde intervensies het geloofwaardige oplossings gegee om die leerders se spinale gesondheids hindernisse te hanteer en die effektiwiteit van die fasiliteerders te verbeter. Klinici en terapeute moet kennis, gedrag en oefening oorweeg wanneer leerders met lae rug pyn behandel word vir 'n holistiese ingryping. Verdere navorsing is nodig om die doeltreffendheid van verskillende onderrigmetodes vir verskillende ouderdomme wat op langtermyn doeltreffendheid gemik is. Toekomstige navorsing moet ook fokus op die ontwikkeling en implementering van werwelkolom gesondheidsopvoedkundige programme deur werwelkolom gesondheidsopvoedings programme in alle grade in Suid-Afrikaanse skole te toets.

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List of Abbreviations

IDI	-	In-Depth Interview
FGD	-	Focus Group Discussion
LBP	-	Low Back Pain
MSK	-	Musculoskeletal
NRF	-	National Research Foundation
RBW	-	Relative Backpack Weight
WCED	-	Western Cape Education Department

CHAPTER 1: Literature Review

1.1. Introduction

This literature review provides an overview of low back pain (LBP) and back care amongst children and adolescents. The following electronic databases were searched: Cochrane, Google Scholar, PEDro, PubMed, and the Stellenbosch University electronic library database. Different combinations of the key terms “spinal health”, “back care”, “back pain”, “adolescent”, and “child” were used to search the databases. The database searches were conducted between March 2016 and October 2017 and relevant studies were obtained for inclusion in this literature review.

1.2. Child and adolescent LBP’s contribution to the world population

Musculoskeletal (MSK) disorders are the fourth greatest burden on the world population’s health.[1,2] LBP is the most prevalent MSK condition and the most common cause of disability worldwide.[1,2] Annually LBP contributes billions of dollars in medical expenditure to the economic burden, with adolescents making up 15% of the LBP population.[1] With back pain reported in childhood and adolescence being a significant indicator for back pain in adulthood[3-5], school based education of children and adolescents on the principles of back care are seen as a plausible way of reducing the burden caused by back pain.[6]

1.3. Low Back Pain in Children and Adolescents

LBP is a common cause of morbidity and disability worldwide affecting people of all ages.[1,2] Although the economically active stratum of the population is most affected, an increasing number of children and adolescents experience LBP.[1] The increase in child and

adolescent LBP could be due to school-going adolescents engaging in commercial activities after school to help ease the economic burden on their families.[7] However, this reason is only given for African countries and reasons for the increase in LBP amongst adolescents in high income countries may be different.[7-8]

The prevalence of adolescent LBP varies widely between countries ranging from 7 to 70%, depending on the study design and pain definitions.[7-10] In African countries, up to every second adolescent experiences back pain.[7] Research reporting on the prevalence of LBP amongst children is considerably less than for adolescent LBP. However, an estimated 15% of African children have experienced LBP at some stage of their life.[8]

There is inconsistent reporting of the difference between genders in terms of LBP prevalence among children and adolescents. Research shows either no difference between genders or a higher LBP prevalence in females.[5,7,9,11-12] The reason for the inconsistency could be attributed to very few studies reporting on the differences before and after the onset of puberty.[9] Only one study has differentiated between before and after onset of puberty identifying that LBP prevalence between genders are the same under the age of 10 years but differ after the onset of puberty.[9] LBP reported by females could then be related to menstruation and physique changes brought on by puberty and explain why adolescent females might have a higher LBP prevalence.[9] Females are at greater risk of LBP with the condition being reported earlier in females than males.[13] This could be attributed to females going through growth spurts due to hormonal changes at a younger age compared to males.[3,13-14] The reason for females being at greater risk could also be attributed to females carrying heavier backpacks than males or because of the stronger male physique when carrying equal backpack weights.[15] With several factors contributing to back pain, it

is not surprising to see such a wide prevalence range and potential gender differences in adolescent LBP.[8]

1.4. LBP risk factors and schools as exposure environments

Schools offer a range of exposures that may increase the risk of developing MSK disorders in children and adolescents.[3] These exposures included ergonomics of school furniture, unsafe backpack use, ergonomic risk factors, lack of exercise and low levels of specific back care knowledge.[3-4,7-8] These risk factors may contribute towards a range of multifactorial pathways. Despite this, parents and teachers' main concern was the heavy backpacks being carried by learners to, at, and from school.[15] Adolescents' most common perceived risk factors for back pain were bending activities, school bag weight and sitting for a prolonged period of time.[7] Spinal curvature, spinal misalignment and muscle spasms can be a result of postural changes caused by long-term backpack use.[15] With so many LBP risk factors, it is not surprising that there would be a difference of opinion about the most concerning factor.

1.4.1. Relative backpack weight

There is a great deal of literature on the relative backpack weight (RBW) of children and adolescents that may be associated with LBP. RBW is calculated as a percentage of the person's body mass.[8,15] Measured RBW ranged from 14.4 to 22% depending on school type, day of the week, school grade and country.[8] Discrepancies for the recommended cut-off weight of backpacks ranged from 10-15% with 15% being widely recommended.[15-16] The difference between 10% and 15% was about 3kg which translated to between 1 and 2 school textbooks.[15] Backpacks weighing 15% of body mass in adolescents appeared to be too heavy to maintain a correct standing posture.[16] Adolescents who carried backpacks

weighing more than 10% reported back pain, while those who carried backpacks weighing below 10% did not.[15] Physical compensations such as forward leaning and postural alignment asymmetry were also seen when RBW exceeded 10%.[8] Younger and smaller learners were also at greater risk as they weighed less while carrying the same weight as older learners, which resulted in an increase in the RBW.[15] With back pain being reported when RBW exceeds 10% it would suggest that a 10% cut-off weight would reduce the risk of LBP more than the 15% cut-off weight.

1.4.2. Ergonomics and Posture

Poor ergonomics and posture is another school related factor that may be associated with MSK disorders such as back pain or discomfort.[9,14] Various spinal posture misalignments originate in childhood and adolescence due to the spine's vulnerability during rapid MSK development.[3,14] Postural misalignments, such as forward head posture, kyphosis, lordosis and scoliosis are spinal conditions that can cause back pain.[17] Pain intensity is related to the severity of the MSK condition but even the slightest spinal misalignment from poor ergonomics or posture could be painful.[17]

Prolonged sitting, such as children and adolescents experience at school, is also associated with back pain.[8,14] Muscle fatigue due to prolonged sitting can cause back discomfort and pain that places children and adolescents at risk of back injury.[18] Also, passive flexion stiffness increases after one and two hours of sitting for males and females respectively.[18] As muscle fatigue and stiffness worsens the longer an individual sits, so too does the risk of developing back discomfort or pain.

In the modern technological age, children and adolescents spend an increasing amount of time sitting in front of a TV or computer, developing a static and passive lifestyle.[14,19] The

combined effects of such a lifestyle can lead to incorrect posture, in addition to inefficient and harmful movement patterns.[19] Adding to the negative effects of a sedentary lifestyle, school furniture that cannot adapt to a child's rapid growth, negatively influences a child and adolescent's ergonomics and posture in the classroom.[19] This problematic design of school furniture is not recognised by educational managers.[3] Ergonomics, posture and sitting duration influences spinal alignments which, when incorrect, can lead to back discomfort and pain.

1.4.3. Physical activity level and LBP

Children and adolescents who are physically over active and those who are minimally active are at greater risk of developing back pain.[8] Over active children and adolescents are at risk of overuse injuries while minimally active children and adolescents are at risk of injuries due to underuse of muscles.[8] There is, unfortunately, no evidence for specific over and underuse activities making it difficult to determine to what extent physical activity influences the risk of developing back pain.[8]

1.4.4. Spinal health knowledge

A lack of spinal health knowledge and inadequate instructions on spinal care during childhood and adolescence could result in poor postural habits.[3] These poor postural habits can subsequently lead to pain and structural skeletal deformities.[3] Children and adolescents were found to be the most lacking in knowledge relating to spinal anatomy, spinal pathology and maximum backpack weight.[3] A possible reason for this lack of knowledge could be due to the complexity of these topics, and that children and adolescents don't fully comprehend the topics resulting in poor spinal health decisions

being made.[3] This suggests that proper education on spinal health is needed to address the lack of and incomprehensible knowledge of children and adolescents.

1.5. LBP impact on an adolescent individual

The impact of LBP on an individual is extensive, with individuals potentially being a burden to their families, having a decrease in independence and having less financial stability.[20] LBP can negatively impact an individual's quality of life through partial and temporary decrease in the execution of daily activities.[9] Adolescent LBP has the greatest impact on an individual's sport participation, bending activities, sitting and reaching up, while the impact on carrying a schoolbag in comparison is considerably lower.[13] Adolescent back pain is associated with higher RBW, reduced school attendance and scholastic functioning, reduced sports participation time and an increased use of chiropractic care.[9,14-15] Up to 16.1% of adolescents have reported missing school days due to back pain.[15] Lost school time can cause a decrease in academic performance and, depending on the severity of the LBP; an individual could potentially be forced to drop out of school.

The most significant negative impact of LBP is on the physical functioning and physical health of an individual.[9,14] The reason for LBP having such a negative impact was due to symptoms resulting in loss of function, attributed to the diminished performance in everyday activities.[9,20] LBP is also associated with reduced social interactions and psychological functioning.[9,14] Persons suffering from LBP were prone to avoiding social interactions, which resulted in damaged relationships.[20] Psychosocial functioning was affected by other individuals regarding LBP claims as unwarranted, especially when the complainant participated in activities while experiencing pain.[20] These claims were further delegitimized due to no visible injury or adequate diagnosis being given.[20] LBP impacts on

an adolescent individual's education, physical capabilities as well as emotional wellbeing which reduce their quality of life.

1.6. Parental influences on spinal health and back care

Parents' main concern regarding their children's spinal health was the heavy backpacks that they had to carry.[15] Even though parents were concerned about the weight and size of their children's backpacks, only a third of parents had checked the contents and 4% had weighed their children's backpacks.[21] Significantly heavier backpacks were carried by children whose parents had never checked their backpacks' content or weight.[21] Research had mostly focussed on adolescents' backpacks when investigating spinal health, which gave a biased view of parental influences on the spinal health and back care of their children.

Parents also played a role in their children's reporting and consequent treatment of LBP symptoms, irrespective of the symptoms' severity.[13] There was no association between the severity of disability caused by LBP and health-care seeking behaviour in adolescents.[13] The reason for the poor health-care seeking behaviour could have been attributed to poor communication between parents and their children, due to perceived emotional overload.[8] It was also postulated that children and adolescents feared parental criticism and consequently didn't report symptoms.[5,13] Even though LBP is common amongst adolescents, only 16.3% of parents were aware of their children's LBP.[5] Treatment seeking behaviour also differed when two children, from different families, seemingly had the same symptoms.[8] One child might have been taken to a doctor while the other would have been told to wait and see what happened.[8] A possible reason for higher reported prevalence of adolescent LBP could then be attributed to them having parents who suffered from back pain.[8]

1.7. School based interventions to address LBP

Children and adolescents showed an increase in and retention of knowledge and ergonomic concepts from spinal health education into adulthood, without any fear-avoidance beliefs being reinforced.[3-4,6] Spinal health and back care educational programs had been presented at schools by physiotherapists, with sessions spread out over a few weeks.[4,6] These educational programs included sessions on basic anatomy and function of the spine; safe backpack use; good and bad postures; and how spinal problems could develop.[4,6] Children's knowledge had also significantly improved after they were given a comic book on the subject of backs by their teachers, which showed that the use of pictures was effective as an educational tool.[10] Even though children's knowledge showed significant improvement following educational programs, no significant changes in spinal health practices or self-efficacy were observed.[4,6] Obtaining theoretical knowledge on spinal health is the first step towards healthy spinal habits and back care for the prevention of back pain.[3]

Starting at a young age, children and adolescents need to be trained in ergonomics as part of the Physical Education curriculum, with increasing intensity and magnitude for greater effect.[10,19] To prevent child and adolescent back pain and discomfort, education needs to be paired with training of correct biomechanical functionality using movement.[19] Children and adolescents were capable of acquiring and comprehending correct movement patterns. The best solution to accomplish correct movement habits was through integrated programs comprised of balanced posture and exercises to improve physical fitness, body function, movement patterns, and ergonomic implications.[19] School furniture also has to be adaptable to children and adolescent's needs in order to improve sitting posture.[10,19] It is

important to note that when adjustable furniture was provided to adults, it did not result in improved posture unless instruction manuals and regular reinforcements were provided.[3] To obtain the best results for behavioural changes, a combination of postural correction and exercise with theoretical knowledge has been advised.[10]

The effectiveness of interventions was not influenced by the age or gender of the children or adolescents.[10] There was, however, a disagreement on the effect of using outside agents or parents and teachers to perform interventions.[10] This disagreement could be due to the subjectivity and differences of children and adolescents. To conclude, children and adolescents do retain knowledge of spinal health education. However, the education programs need to be improved to be adaptable to any circumstance and be more effective in changing the spinal behaviour of children and adolescents.

1.8. Summary

From the literature we have a good understanding of how poor spinal health activities, lack of knowledge and poor ergonomics relate to back pain in children and adolescents, and that risk factors are greatly associated with school environments. With this knowledge in hand, it is unclear why there are so many different opinions about the spinal health of children and adolescents. Qualitative research can be used to explore and develop these theories and move towards explanations to improve the effectiveness of interventions.[22] To our knowledge there are no published qualitative studies to explore LBP and poor spinal health in schools.

CHAPTER 2: Manuscript

This manuscript shall be submitted to the WORK journal for publication. The specifics for publication are presented in Appendix 1.

2.1. INTRODUCTION

Low back pain (LBP) is a common cause of morbidity worldwide, affecting people of all ages.[1-2] Although the economically active stratum of the population is most affected, an increasing number of children and adolescents experience LBP.[1] The life-time prevalence of adolescent LBP varies widely between countries, ranging from 7 to 70% depending on the study's research design and pain definition.[7,9-10,23] In African countries, up to every second adolescent experiences LBP.[7,12-13] The risk of LBP among African adolescents increases with chronological age and engagement in commercial activities.[7,12] Due to economic reasons, many school-going adolescents are forced to engage in after-school commercial activities which are believed to be the reason for the increase in adolescent LBP prevalence.[7] Even though non-specific LBP is common amongst adolescents, most parents remain unaware of the presence thereof.[13] It is postulated that children fear parental criticism and consequently don't report symptoms.[13] During the day children and adolescents spend most of their time at school, which is an environment where they are exposed to spinal health risk factors.[24]

Schools are potential environments for children to develop musculoskeletal disorders, such as LBP, due to regular exposure to ergonomic risk factors.[3] Risk factors in schools for child and adolescent LBP have multifactorial influences including unsafe use of backpacks, ergonomic risk factors, lack of exercise and low levels of specific back care knowledge.[3-4,7] Ergonomic risk factors for spinal health include inadequate furniture, postures during

prolonged sitting periods and carrying heavy backpacks[3] while choosing the incorrect type of backpack, incorrect packing, and incorrect lifting and carrying of backpacks are seen as methods of unsafe backpack use.[4] Some of these school related spinal health risk factors can be modified by educating children and adolescents on back care[4,11], but the effectiveness of preventative interventions is affected by moderator variables such as teaching methods.[10] Risk factors at school can lead to spinal deformities and pain in children and adolescents.[3,14,18]

In South Africa children and adolescents spend a minimum of 5.5 hours per day at school, most of which is spent in awkward sitting positions.[25] Various spinal posture misalignments originate in childhood and adolescence due to the spine's vulnerability during rapid musculoskeletal (MSK) development (growth spurts).[3,14] Postural misalignments, such as forward head posture, kyphosis, lordosis and scoliosis are spinal conditions that can cause back pain; the pain intensity is related to the severity of the condition.[17] Furthermore, muscle fatigue due to prolonged sitting can cause back discomfort and pain that places children and adolescents at risk of back injury.[18] Passive flexion stiffness increases after one and two hours of sitting for males and females respectively.[18] Back pain reported in childhood is a significant indicator for back pain in adulthood.[3-5] Currently there is no definition for spinal health or back care but these terms are used in literature as concepts pertaining to the prevention of back pain.[3-4,11]

Children and adolescents retain knowledge of spinal health education up to adulthood without fear-avoidance beliefs being reinforced.[3-4,6] Spinal health educational programs have been presented at schools by physiotherapists with sessions spread out over several weeks.[4,6] These educational programs included sessions on the basic anatomy and

function of the spine; safe backpack use; good and bad postures; and how spinal problems can develop.[4,6] Even though children's knowledge showed significant improvement following educational programs, no significant changes in spinal health practices or self-efficacy were observed.[4,6] To obtain the best results for behavioural changes, a combination of postural correction and exercise has been advised.[10] To conclude, children and adolescents do retain knowledge of spinal health education, however, the education programs need to be improved for effectiveness.

In order to improve the effectiveness of spinal health educational programs, in an effort to improve spinal behaviour of children and adolescents, research is needed to identify and explore the reasons why changes are stunted. To assist with the development of spinal health promotion strategies, the current perspectives and knowledge of different socio-economic societies and cultures need to be explored. Qualitative research can be used to describe complex phenomena by initially exploring to develop theories and to move towards explanations.[22] Individuals directly and indirectly associated with the target population, children and adolescents, should have the greatest insights into the phenomenon. By explaining and clarifying events and individuals' experiences, qualitative research can be used to complement quantitative research.[22]

To our knowledge there are no published qualitative studies to explore LBP and poor spinal health in schools. There is a lack of published research about child and adolescent spinal health in South African Schools. Also, research is needed to improve school based spinal health and preventative strategies. Knowledge of uniquely South African perspectives about spinal health of children and adolescents is necessary, due to the differences in educational systems, compared to other countries and to ensure that interventions are context specific.

The study aimed to explore what the perspectives of learners (children and adolescents), teachers and parents/guardians were on the spinal health of learners in the Langeberg Municipal District of South Africa. The objectives for the study were to explore and describe barriers and facilitators for the promotion of spinal health and to describe strategies and delivery methods to promote spinal health in schools. The findings of this study will help raise awareness of spinal health and help prevent child and adolescent LBP. The findings can also be used in conjunction with other studies' results to improve on educational back care programs for learners.

2.2. METHODOLOGY

2.2.1. Study Setting

The study was purposively conducted in the rural region of the Langeberg Municipal District of the Western Cape, South Africa had a total population of 99'609 in 2013.[26] The district has 54 schools, excluding pre-schools, comprising of Combined (n=4), Intermediate (n=5), Primary (n=41) and

Secondary (n=4) Schools. Of the 54 schools in the district, only one was an independent private school. At the start of 2017 there were 18'325 Grade 1 to 12 learners enrolled in these schools.

2.2.2. Study Design

For this study, a descriptive qualitative case study design with an interpretative and phenomenological approach was used. The phenomenon that was explored in this study is

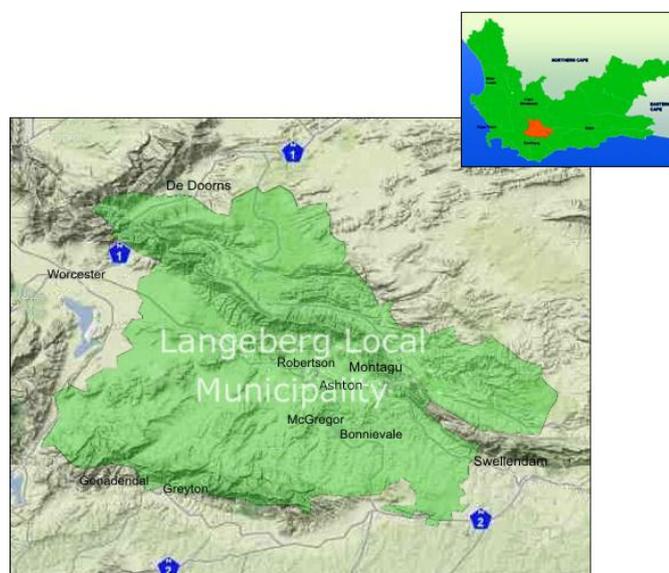


Figure 2.1: Langeberg Municipal District Map

the learners, teachers and parents/guardians' knowledge and perspectives about spinal health barriers, facilitators and plausible interventions for spinal health promotion in schools. The study made use of two qualitative methods, i.e. In-Depth Interviews (IDI's) and Focus Group Discussions (FGD's); for data collection.

2.2.3. Ethics and Permission

This study was approved by the Health Research Ethics Committee at Stellenbosch University (Ethics reference number S16/10/187) (Appendix 2) and was conducted according to the ethical guidelines and principles of the International Declaration of Helsinki. Permission to conduct the study in the Langeberg Municipal District's schools was obtained from the Western Cape Education Department (WCED) (Appendix 3). All participants gave signed informed consent prior to being interviewed or participating in a discussion group (Appendix 4-6). In the case of learner participants, consent was obtained from the parents and assent was given by the learners (Appendix 7-8).

2.2.4. Researcher Characteristics and Background

The researcher underwent training in qualitative research methods for health sciences, which included interviewing skills, as preparation for data collection and analysis. This training was also used to pilot test the study's interview schedule to ensure questions asked obtained the intended data. The researcher is a female physiotherapist who grew up in the district, which may have influenced the qualitative information obtained from the participants.

2.2.5. Sample Selection

The study population comprised of school administrators in the form of principals and teachers; learners; and parents or guardians. The key determining variables used for

selection of schools were the geographic region, including schools from all 5 towns in the district; school type, with Primary, Intermediate, Secondary and Combined Schools being included; and higher and lower socio-economic statuses by referring to the WCED's registry of schools with and without school fees. Schools were purposively selected to ensure inclusion of all criteria. School characteristics were purposively omitted to ensure the anonymity of the participants.

Learners were selected by the researcher to be able to include at least one group from the Foundation (grades 1-3), Intermediate (grades 4-6), Senior Phases (grades 7-9) and Further Education Training (grades 10-12). Including learners from all education phases ensured ages ranged from 8 to 18 years. The gender of learners was dispersed equally between male and female on selection of the group. The learners were nominated by the class teacher, who was identified by the school principal as having the most interaction with the learners. The racial representation in the groups reflected the ethnic groups found in the specific schools. Learners with high and low academic standing, as ranked by the school, as well as learners participating and not participating in extramural activities were included.

Parents/guardians were selected by the researcher based on the educational phases of their children, ensuring exposure to all phases. All teachers from selected schools' staff were eligible for inclusion in the study. This ensured that teachers of all ages, both sexes, and teaching in different educational phases were included. Principals had to have a minimum of 5 years' experience as Principal of the selected school in order to be included in the study; this helped to ensure that the Principals' knowledge was primarily related to the selected school. These selection criteria, as depicted in Table 2.1, ensured that a diversified set of participants was selected to participate in the study.

Table 2.1: Selection Process

Town	School	School Type	Phase*	Grades	Participant group	School Fees **
Town A	School A	Primary	1-3	1-7	Teacher	Yes
	School B	Secondary	3-4	8-12	Teacher & Parent	No
	School C	Primary	1-3	1-7	Parents	No
Town B	School D	Combined	1-4	1-12	Principal	Yes
			4	12	Learners	
Town C	School E	Intermediate	1-3	1-8	Teachers	No
Town D	School F	Primary	1-3	1-7	Principal	No
	School G	Intermediate	3	8-9	Learners	No
	School H	Secondary	3-4	8-12	Teachers	Yes
	School I	Primary	2	6	Learners	Yes
	School J	Intermediate	1	3	Learners	No
Town E	School K	Secondary	4	11-12	Learners	No
	School L	Secondary	3-4	8-11	Parents	Yes
	School M	Primary	1-3	1-7	Principal	Yes
			2	4-5	Parents	
School N	Primary	1-3	1-7	Principal	Yes	

* 1=Foundation phase, 2=Intermediate Phase, 3 Senior Phase, 4=Further Education Training

** No school fees = school children exempt from school fees indicating a low socio-economic school

2.2.6. Participant Recruitment

Selected schools were contacted telephonically and appointments made with school principals. The study was explained to the school principals and any questions asked were answered by the researcher. Permission to include participants from the schools was obtained from the principals. Where principals agreed to participate in the study, interview dates were set. Learners were selected with the assistance of the grade teacher and dates for data collection set according to the class schedule.

Parents/guardians were approached through the school with assistance from a staff member. Parents/guardians were contacted telephonically and dates set for the FGD's. One planned FGD with parents was rescheduled as IDI's as a suitable date and time for the group of participants could not be reached.

2.2.7. Data Collection

Data were collected at the participants' most convenient locations which, except for three IDI's with parents that were conducted at their homes, were conducted at the schools. A study supervisor and a PhD student were present during one and two FGD's as non-participating observers respectively. The researcher's occupation and the reasons for the study were discussed with participants as part of the consent process.

The aim of the IDI's and FGD's were to elaborate on pre-set main themes and sub-themes that emerged from the data. All IDI's and FGD's were conducted by the researcher between March and June 2017. All IDI's and FGD's were recorded using a digital voice recorder and then transcribed by the researcher. Extracts of transcriptions are added in Appendix 9. Recordings and transcripts were saved on a password protected laptop which was only accessible by the researcher.

An interview schedule was used to guide the questioning during the IDI's and FGD's. Depending on the literacy level of the participants, two different sets of questions with variable wording were used (Appendix 10). The questions were developed from objectives and constructed to be open ended as to avoid biasing the participants' responses and broadening the scope of information gathered. Questions were also translated into Afrikaans as 47 (87%) of the schools were Afrikaans medium (Appendix 11). The IDI's and FGD's were done in the participants' preferred language. Only one IDI was done in English as

the participant indicated English as her home language. The questions used were the same for both groups (IDI's and FGD's) and the phrase *spinal health* was defined as "taking care of your back" to all participants:

1. What do you know about spinal health?
2. What type of spinal health education have you been exposed to?
3. What are your feelings towards the spinal health of learners?
4. What do you think the impact of spinal health is on an individual?
5. What do you think signs of poor spinal health are?
6. What do you feel are the facilitators and barriers to good spinal health?
7. What do you think can be done to facilitate with spinal health barriers?
8. What do you think are the most important aspects to be included in good spinal health promotion?

The duration of the sessions ranged from 30 to 60 minutes with only one group session lasting less than 30 minutes. The researcher took notes on the discussion schedule during the interview and discussion sessions. A summary of the discussion sessions was made after each session was concluded and included the session's characteristics; main themes; surprising information; and new themes not emerging from previous sessions.

Transcripts were not returned to the participants for comments but random transcripts were compared to their recording by an independent researcher to ensure credibility of the data. The study results were returned to random participants for comments. One repeat FGD was conducted with a group of Secondary School learners, within the same community of a group of Primary School learners, after inconsistent data about the influence of violence was obtained from the latter group. The researcher continued to conduct IDI's and FGD's until data saturation pertaining to the study objectives were reached.

2.2.8. Data Analysis

Data analysis was performed only from the transcripts to avoid researcher bias. Inductive reasoning was used to explore the phenomena of spinal health in learners and to then narrow the scope of the study according to the objectives. Inductive reasoning was used due to limited qualitative research in the field and there is no existing model or framework to base the study's findings on. Each transcript was read multiple times and coded by the researcher according to ten main themes derived from key words in the topic guide questions. Sub-themes were derived from emerging data within the main themes and linking main themes were subsequently grouped into families. The Coding Tree (Appendix 12) depicts the codes used by the researcher. The researcher made use of ATLAS.ti computer software for the coding and data management. The data from the different participant groups (learners, parents/guardians, principals and teachers) were grouped together, analysing each group's data separately and then combining the data sets to form one collective data set. The principle researcher discussed and reflected on the themes and sub-themes with two co-authors. Transcripts were not translated and remained in their original language as the researcher is equally proficient in both Afrikaans and English. The data analysis was done from these original transcripts.

2.2.9. Trustworthiness

As qualitative research does not make use of established validity and reliability measurements, quality criteria for qualitative research were adhered to during the study process to ensure the trustworthiness of the study. The quality criteria for qualitative research are credibility, transferability, confirmability and dependability. Credibility was ensured by adopting a semi-structured question format which ensured all participants were

asked the same questions but allowed the researcher leeway to ask further explorative questions on the topics raised. In addition, two data collection methods (IDI's & FGD's) were employed to make up for individual shortcomings. By using IDI's the researcher was able to go into more detail with certain topics with the particular participant. Whereas the FGD's allowed for participants to comment and elaborate on each other's thoughts and ideas broadening the perspectives. By using both IDI's and FGD's the researcher ensured both narrow and broad investigation of the topics. These steps instil confidence in the researcher that the study's findings are true and accurate.

The transferability of the study's findings is not limited to only rural schools as used in the study, but can also be applicable in other contexts. Other contexts could refer to similar situations, populations and phenomena. Other rural schools in South Africa are included in the situations, being the most similar to this study's situation. The population of this study is similar to the population in South Africa with regards to the age of learners. The study population was sourced from public schools which make up the majority of the schools found in South Africa, therefore making the findings applicable even in different situations. By extension, the phenomena of spinal health in schools can be observed in any school across the globe, making the study's findings applicable and partially transferable to any other school.

To ensure the confirmability, the study's methodology is described highlighting the researcher's neutrality in the findings. The study's findings are based on the participants' responses and not from the researcher's personal motivations and potential bias. Triangulation of data further reduces the effect of researcher bias on the study's findings.

Dependability of the study's findings was ensured by describing the research process and data analysis. By using the same methods in repeat studies, researchers should be able to produce consistent findings. The research process and data analysis was also reviewed externally to ensure consistency of the findings.

2.3. RESULTS

2.3.1. Demographic Data

As depicted in Table 2.2, the demographic data of 93 subjects were captured of which 66 were female and 27 were male participants. In total 9 IDI's and 11 FGD's were conducted. Participants identified themselves as white (32%), coloured (57%) or black (11%). The participants spoke in their preferred language, of the 93 participants only one participant spoke English and one participant spoke a mixture of English and Afrikaans while the remaining participants all spoke Afrikaans. Table 2.3 depicts the number of schools and enrolled learners per town region.

Table 2.2: Demographic Data

	Participants n(%)	Male n(%)	Female n(%)	F/M Ratio	Age range (Mean)	No. of IDI/FGD	Race		
							White n(%)	Coloured n(%)	Black n(%)
Learners	43 (46)	18	25	1.39	8-22 (14.51)	0/5	8	31	4
Parents/Guardians	17 (18)	1	16	16	27-63 (43.65)	3/2	5	10	2
Principals	4 (4)	2	2	1	41-62 (55.25)	4/0	3	1	0
Teachers	29 (31)	6	23	3.83	22-61 (39.03)	2/4	14	11	4
Total	93	27 (29)	66 (71)	2.44	8-63 (29.24)	9/11	30 (32)	53 (57)	10 (11)

Table 2.3: District Schools and Learners

Town	Schools n(%)	Enrolled Learners n(%)	Schools Included n(%)
A	6 (11.1)	3843 (21.0)	3 (21.4)
B	10 (18.5)	2315 (12.6)	1(7.1)
C	3 (5.6)	473 (2.6)	1 (7.1)
D	16 (29.6)	3106 (16.9)	5 (35.7)
E	18 (33.3)	8526 (46.5)	4 (28.6)
F	1 (1.9)	62 (0.3)	0 (0.0)
	54	18325	14

Five teachers from one group were unable to participate on the set day of the FGD due to changing schedules and personal responsibilities. Two learners were absent on the day of the FGD due to illness and three failed to return their parental consent forms and were subsequently excluded. One group of parents initially selected from a selected school was not willing to participate in the study for reasons unknown to the researcher.

2.3.2. Themes

The IDI's and FGD's provided insightful information as participants shared their experiences and ideas. The most relevant themes and sub-themes about the participants' perceptions are discussed in the sections below followed by supporting quotes. Participant quotes are provided with participant identifiers (gender, age, school type, and participant group). The quotes were translated from Afrikaans to English for this paper by the researcher; back translation was used to ensure that the quotes' meanings remained the same.

2.3.2.1. Theme 1: Barriers associated with self-care of spinal health

This theme describes factors identified by participants as barriers to spinal health or back care in schools. The sub-themes that emerged from the data, describe specific factors which may bar learners from taking care of their backs. The barriers associated with spinal health

of learners were multifactorial including sedentary lifestyles, dangerous gameplay, sports' risks, poor ergonomics, schoolbags, insufficient knowledge and pregnancy risks. Proper school furniture and schoolbags are not in sufficient or affordable supply and decreased activity leads to injuries while doing sport or exercise.

Sedentary lifestyles and bad postural habits of learners

Modern technology and low nutritional diets have greatly contributed to the passivity of learners, with minimal funding, being overweight or tall adding to poor spinal health seen in schools.

Teachers were concerned about the physical strength capabilities of learners due to physical inactivity or passivity at home. This was attributed to the influence of modern technology, with learners mostly watching TV or playing on a cell phone, tablet or computer. Additionally, learners' ergonomic and postural interaction with technology was worrying.

Interestingly standing out among peers with regards to length was seen as a negative influence on spinal health. Parents stated that overweight learners struggled and complained more about their backs which resulted in them not participating in sports or exercise. It was the belief of teachers that learners' poor postural control when writing was due to inactivity causing poor muscle tone in the trunk girdle. The costs involved for treatments were considered an obstacle and reason why required treatment was not sought. Concerns regarding insufficient nutrients for healthy physical development in learners and the effect on spinal health were also expressed.

"It worries me. It does worry me because of the inactivity of our children at school. And I see it not only in their spinal health particularly, but in their lack of physical

strength that our children today have compared to what we had when we were young.” (Female, 61, Secondary School Teacher)

“They sit in front of the TV; they sit and play with a cell phone. I think that back health is in a very bad state in South Africa because of sitting so much and sitting incorrectly.” (Male, 62, Primary School Principal)

“I have a friend whose daughter is overweight and she complains about her back a lot and then she doesn’t want to do sport.” (Female, 49, Secondary School Parent)

“Children who are tall have the problem that they want to be short, they want to be like other children, and then they bend their backs the whole time.” (Female, 11, Primary School Learner)

“Children don’t play and develop those muscles so they have low muscle tone in the trunk area and then they can’t sit and write properly.” (Female, 44, Intermediate School Teacher)

“The vast majority of children that have problems don’t have the funds to receive therapy.” (Female, 42, Primary School Principals)

“If you don’t get the right nutrients, sufficient nutrients, then your skeleton is going to develop poorer.” (Female, 42, Primary and Secondary School Parent)

Dangerous gameplay of children

Rough play is seen as the norm with children ignoring their parents’ warnings.

Participants expressed concern about the rough and, sometimes, aggressive nature in which learners played. Teachers saw rough play as bullying and attributed this behaviour to what learners were exposed to at home or maybe within their environments. Learners seemed to model older children and they were influenced by what they saw on television. Parents added that their children didn’t heed warnings about how they played and reported that they responded in anger when children were injured while playing.

“They play rough at school. They strike each other. They are wild. They wrestle and everything.” (Female, 54, Primary School Parent)

“They wrestle. If something is fun then they (children) do it in any case.” (Female, 43, Secondary School Parent)

“Children do what they see at home. They would kick and choke others, that’s not playing, they’re bullies.” (Female, 58, Primary School Principal)

“Children from being, playing wild. You just told them then they run around doing it again. Go complain there where you got injured!” (Female, 34, Primary School Parent)

Sports’ injury risks

Lack of education on the part of the teachers (coaches), insufficient warm-ups, unfit learners and very vigorous sports are contributors to back problems. Learners also play sports while injured so as not to be left out.

Learners commented that due to their nature, sports like rugby, hockey, netball and cricket could lead to back injuries. Learners expressed that being unfit, improper warm-ups before matches and coaches with questionable competency could increase their risk of injury or back pain. Although learners expressed their belief that even though participating in sports is not always beneficial for them (due to e.g. illness), they would not stop their participation. Parents’ belief was that learners wanted to *“belong and be a part of something”* which resulted in sport participation while injured instead of recovering. Parents attributed the injuries sustained by learners to insufficient and improper warm-ups before matches, with learners admitting to lying to their coaches about doing sufficient warm ups. Teachers expressed their concern in their own abilities to coach sports and stated that smaller schools

expected all staff members to coach sports, irrespective of whether they had received any training.

“They play hard, then they get tackles hard or when you are in the ruck and everyone dives at you.” (Female, 19, Secondary School Learner)

“If you have to bowl for long, then it (back) is sore, but I just carry on.” (Male, 11, Primary School Learner)

“Children are unfit. Then you have to play all those matches.” (Male, 17, Secondary School Learner)

“No, it probably isn’t always good, but I’m not going to stop, I enjoy it.” (Male, 18, Secondary School Learner)

“They don’t warm up right, it’s not good enough. You have to be warm, your muscles. That’s why he got injured.” (Male, 62, Secondary School Parent)

“The coach isn’t always there, then you don’t feel like warming up.” (Male, 18, Secondary School Learner)

“I have to coach shot-put, I look like I can do shot-put, but I never did. I can do something wrong. We don’t have outside coaches like the big schools.” (Female, 33, Primary School Teacher)

Poor furniture ergonomics in the classroom

Incorrectly sized or broken school furniture, together with long periods of sitting still, is not beneficial to good spinal health.

Participants were concerned with the length of time learners had to sit in classrooms as it reportedly influenced the spinal health as learners made use of awkward adaptive postures. The type of chair or desk and the anthropometric fit thereof to learners was identified as noteworthy furniture considerations for spinal health. Learners and parents especially

expressed concern about the quality of the school furniture and the impact it might have on spinal health. Additionally, classroom layout was nominated as a consideration to improve the ergonomic practice in the classroom.

“My problem is children that sit too long and continuously sit in classes.” (Male, 62, Primary School Principal)

“My back gets sore if I sit for too long in one position.” (Female, 11, Primary School Learner)

“Sometimes you get, then it doesn’t feel right to you because you sit too long. And then your back or your butt gets stiff. Then it feels like you can’t move.” (Female, 22, Secondary School Learner)

“These school desks are a lot of trouble to sit in, I can’t sit up straight, I slouch. And when I’m tired I slouch more. I feel it when I play piano too.” (Female, 18, Combined School Learner)

“Sometimes I move down to rest with my head on the desk behind me, just to relax, then my neck gets sore.” (Female, 18, Secondary School Learner)

“The laboratory stools, they can’t be good for the children. I think, I don’t know, maybe.” (Male, 27, Intermediate School Teacher)

“There’s no back support, it (laboratory stool) is good for your abdominal muscles, but bad for your back.” (Female, 17, Combined School Learner)

“The stool is high and the table not, then you have to write like this, you have to bend down to the table.” (Male, 19, Secondary School Learner)

“These things, the wood, what’s it called, backrest is hard, I don’t like sitting against it.” (Female, 18, Combined School Learner)

“Some of the desks, then it is just the iron at the back. And some people will lie against that iron, later in the day they can’t stand up.” (Male, 20, Secondary School Learner)

The school desks don't comply with standards according to me. At parent's evenings I try to get into those things and there's no way, the bench is short, it doesn't support your thigh. And there are children who are bigger than me at school." (Male, 62, Secondary School Parent)

"If the desks are turned towards each other and the teacher doesn't even have a central point from where the class is taught, then you get that the children have to turn around." (Male, 62, Primary School Principal)

School bag types, weight and carrying methods

The importance of the type, weight and the way schoolbags are carried is not emphasised enough. Financial restraints also lend themselves to the learners not having the correct bags.

Participants stated that learners were required to carry many heavy textbooks every day in their schoolbags. Parents stated that there were no schoolbags on the market rated for the weight that learners needed to carry. Teachers said that learners carried all the textbooks in their schoolbags every day as they were afraid that they would forget some of them. Participants said that learners carried their schoolbags incorrectly, either just on one shoulder or hanging very low on their backs, in order to look 'cool'. Learners admitted that these statements were true and added that the forward leaning posture caused by carrying bags over both shoulders to counteract the weight of the bags, looked wrong. Furthermore, learners said that it was quicker to sling their bags over one shoulder. Parents stated that they were more concerned about the way in which the learners were picking up their bags than how they were carrying them, as learners were usually bent and rotated when picking up their bags.

Principals acknowledged that, due to the low socio-economic status of many households in the school districts, the type of schoolbags that should be used by the learners could not be prescribed. The low socio-economic status was also the reason why some learners carried their textbooks in plastic shopping bags. It was the belief of principals that the soft backpacks used by many learners were not properly supportive of the learners' backs. Learners, however, stated that the soft backpacks were more comfortable to carry and that stress increased the discomfort of carrying a heavy schoolbag. Principals were concerned about the manner in which learners pulled wheeled schoolbags, stating that when the wheels caught on an obstacle, it caused the learners' rotated backs to be jerked.

"The children's bags are really heavy with all the textbooks they have to carry."
(Female, 32, Primary School Teacher)

"Heavy suitcases are carried incorrectly." (Male, 60, Combined School Principal)

"It doesn't look right when you lean forward like that because of your bag." (Female, 17, Combined School Learner)

"It's quicker. If I put my bag properly over both shoulders then by the time I'm done, they are in the next class already." (Male, 18, Combined School Learner)

"The little ones when they start here in grade 4 with textbooks, it's pretty difficult for them sometimes, they forget their things. So lots are afraid, then they carry everything in their bag and that's how they go to school every day." (Female, 31, Primary School Teacher)

"But I don't worry how he puts it (schoolbag) on (his back)." (Female, 63, Primary School Grandparent)

"When they pick up their bags, I don't know how you did it, but they stand in their desk then turn and bend to pick up the bag next to them. That's the big problem with the heavy schoolbags." (Male, 62, Primary and Secondary School Parent)

“Those backpacks they carry are soft and flimsy, they don’t protect the textbooks or the children’s backs, but they’re cheap. Remember the people in the district are poor. So we can’t tell them what schoolbag they have to buy, we can advise them. And I tell the board every year they can’t when they want to make a rule about the schoolbags.” (Male, 60, Combined School Principals)

“I had one of those student bags with the rigid stuff, but I didn’t like it. My backpack feels better, the padding is more comfortable on my shoulders and back.” (Male, 17, Combined School Learner)

“Children carry their (school) books in plastic shopping bags.” (Female, 58, Primary School Principal)

“When you stress it sits in your shoulders, it hurts, your bag is heavier.” (Female, 19, Secondary School Learner)

“When they pull those bags, the one with the wheels, those wheels are small, they pull the bag behind them with their backs turned slightly. Then the wheels catch and it jerks them. That can’t be good for their back.” (Male, 62, Primary School Principal)

Teachers’ unknowing negative impact on learners’ spinal health

Teachers and Life Orientation (subject) are not properly equipped to encourage spinal health in learners.

Teachers stated that they didn’t actively think about the wellness of learners’ backs and admitted that they unknowingly might have been doing things that were harmful to learners’ backs. Teachers said that they were hurried to complete their work and either forgot or didn’t allow the learners to have breaks during class to stretch their backs. It was the belief of principals that Life Orientation, the one subject that should address the wellbeing of learners, was not being managed optimally and that physical education was too generalised. Principals stated that those who had the power within the school system were

uneducated on spinal health and therefore didn't have the knowledge to address potential issues, unless they personally suffered with back problems.

"It's not like you think of their back every time you do something. So perhaps we could be doing stuff that's not good for their backs." (Female, 29, Intermediate School Teacher)

"You are in such a hurry to finish your work, you don't have enough time. Then you forget about these strategies like the stretching to help you." (Female, 25, Primary School Teacher)

"When you look at Life Orientation, the exercises are not specific to help with the back or sitting and such. Life Orientation should be the most important subject that prepares children for life after school. But that's not how it is." (Male, 60, Combined School Principal)

"The teachers aren't taught about spinal health and what's good for children and bad. Then they become principal and have to make decisions that influence children. I have an idea because I have a back problem and I'm aware of it." (Male, 60, Combined School Principal)

Learners' insufficient knowledge about spinal health

Learners are not sufficiently educated as to the importance of spinal health, which leads to misconceptions. Teachers and parents have difficulty in accommodating the abundance of information and thus spinal health is not addressed by them.

Learners admitted that neither they nor their teachers or parents had sufficient knowledge regarding proper back care, with the adults also sitting incorrectly. Learners stated that if they do not currently experience back pain, they didn't think about their backs. They also stated that they didn't think of the future in relation to their backs as they lived in the here and now. This was why the importance of spinal health was difficult to comprehend.

Learners believed that only elderly people suffered from back pain and had misconceptions regarding the causes of spinal injuries.

Teachers and parents admitted that they lacked the knowledge to identify and address potential spinal health issues of learners. Teachers stated that they were so overworked that they couldn't be expected to read through a lengthy document on spinal health and that parents didn't read lengthy documents sent home by the schools. Principals added that absentee parents, due to long working hours, led to learners not being exposed to parental knowledge at home.

"I don't know how to take care of my back. They don't tell us how or why. They will just tell you so sit up straight." (Female, 14, Intermediate School Learner)

"They (teachers) also don't take care of their backs; they also slouch in their chairs." - (Female, 18, Secondary School Learner)

"Children think only old people struggle with their backs. The children don't think about their backs because they know the old people have to struggle with their backs but they don't have to because their backs are still fine." (Female, 8, Intermediate School Learner)

"Joost van der Westhuizen was paralysed due to paying too much bumper car type of rugby" (Male, 19, Secondary School Learner).

"Children don't think of the future. They are just busy with now. They don't even think of tomorrow." (Male, 15, Intermediate School Learner)

"I don't know how someone looks that has a back problem. I might see someone walking funny, but I won't tell you it's because of his back" (Female, 40, Intermediate School Teacher)

"Unless my child tells me he has pain, I won't notice if something was wrong with his back." (Female, 46, Primary and Secondary School Parent)

“But we have so much work to do, how are we supposed to have time to read a long document about spinal health and know how to implement it. And parents don’t even read a one page letter that the school sends out.” (Female, 42, Primary School Teacher)

“There are lots of those things that when we were young, that mommy and daddy taught you. But you can trace it back to absent parents and parents that work all the time. If you get home you just give the child orders until he goes to sleep and tomorrow morning you drop him off at school or day-care again. The time that parents truly spend with their children to emphasize and talk about these things, get less and less.” (Female, 42, Primary School Principal)

Pregnancy related spinal risks

Parents believed that pregnant teenagers were not sufficiently educated during their pregnancies and that many of them struggled with back problems after giving birth. Male learners expressed concern about pregnant girls that had to carry heavy schoolbags while they already had the added strain of their pregnancy. Learners also said that pregnant girls complained about their backs but wouldn’t allow other learners to assist them with their bags. Learners added that those few who allowed friends to assist them with their schoolbags to reduce their load, in turn increased the load carried by the friend assisting them.

“The girls struggle with their backs after giving birth, they don’t go to the clinic, they don’t know what to do, all those pre-natal class stuff.” (Female, 46, Secondary School Parent)

“The pregnant girls are also a big problem because they also carry backpacks and they are pregnant. The back can’t carry both those weights.” (Male, 19, Secondary School Learner)

“There’s this girl in my class that was pregnant this year, then I ask if I can’t carry her bag for her, but she doesn’t want to give her bag to me. Then she carries her bag, but she always complains her back is sore, but she doesn’t want to give me her bag.”
(Female, 18, Secondary School Learner)

“But if they give their bag to a friend then that person has to carry double.” (Male, 20, Secondary School Learner)

2.3.2.2. Theme 2: Facilitators to assist with Spinal Health and Back care

This theme describes factors identified by participants that help facilitate good spinal health. The sub-themes describe objects, activities and persons who aid learners, if only partially, to take care of their backs. The facilitators for spinal health discussed by participants were markedly less than the barriers and included schoolbags, load reductions and encouragements to learners. Given that some participants stated that they do not believe that there are any facilitators to assist learners with their spinal health, the facilitators discussed were still very insightful.

School bag types and correct carrying methods

Financial restrictions lead to parents not being able to purchase proper schoolbags for their children, while certain bags are preferred by the children as being more comfortable to carry.

Parents said that they were aware of their children’s backs and would buy them the expensive orthopaedic approved schoolbags, if they were able to afford them. Principals said that they encouraged parents to at least buy the rigid schoolbags, rather than the flimsy backpacks that didn’t give any support. Learners said that the padding of the shoulder straps of the softer backpacks helped ease the discomfort of carrying the heavy loads. Principals said that wheeled bags removed the direct load of the heavy textbooks from the spine and,

apart from being relatively inexpensive, were seen as a better option for “*frail children*” and “*young girls*”.

Teachers and parents said that they encouraged learners to carry their schoolbags over both shoulders or to alternate between sides if the bags only had one strap. Learners admitted that when they had to walk long distances, they would carry their bags over both shoulders. Teachers said that the lower grade learners tended to obey them more readily when told to carry their schoolbags over both shoulders.

“I felt sorry for my children because they have to carry those heavy bags. So we decided to buy our children those bags that are medical for your back. And they were very expensive, but we bought them.” (Female, 46, Primary School Parent)

“We tell parents to rather buy those bags that are stiff. We have our own schoolbags with the school’s emblem on that gets sold in the Spar that we prefer them to buy.” (Male, 60, Combined School Principal)

“Yes, those bags, the soft backpacks make that the pain isn’t so bad when you have to walk to school.” (Male, 18, Secondary School Learner)

“Those wheel bags aren’t on the back, so the weight isn’t directly on the child’s back. And they are cheaper than those other expensive bags.” (Male, 62, Primary School Teacher)

“You try to tell them to carry their bag over both shoulders. Or to at least alternate between sides, but they don’t always listen.” (Female, 49, Secondary School Teacher)

“At school I put it over one shoulder. But when I know I have to walk far some afternoons after school, then I put my bag on right, over both shoulders.” (Male, 18, Combined School Learner)

“The children believe everything that their teacher says. If the teacher says do this, then they do it.” (Female, 32, Primary School Teacher)

Heavy schoolbag load reduction

The reduction in the number of textbooks that needed to be carried every day would greatly decrease the load that needed to be carried. Proper balancing of the load in the backpacks could be achieved by repositioning the different sized textbooks, which would also greatly assist.

Principals said that learners were mostly dropped off at school which reduced the overall time learners had to carry the load. Parents said that learners packed their textbooks according to their class rosters, which teachers said was allowed. Some teachers said that they also allowed the learners to leave their textbooks in the class if there was no homework for that subject or if they had finished their work in class. Participants viewed school lockers as an alternate and more effective way to reduce schoolbag loads as learners would not have to carry all their textbooks all day. Learners added that the thinner A4 textbooks were more comfortable to carry than the A5 textbooks, as they were better able to balance the load in their bags.

“Very few children walk home. The taxis and the cars, when they stop here (at school) in the mornings and the afternoons, you can see it.” (Male, 62, Primary School Principal)

“Some teachers will allow the children to leave textbooks in their class, but then the teacher becomes responsible for the book. I don’t do that, books get taken and then they complain if their book is gone.” (Male, 34, Secondary School Teacher)

“I will let the children leave their textbooks in class if they have finished their homework. Because they don’t do it at home, this way at least they try.” (Female, 49, Secondary School Learner)

“I have a locker. It helps a lot because if you have to have all you homework books in your bag at the end of the day, then your bag is much heavier than it was between breaks.” (Female, 18, Combined School Learner)

“My kids pack their bags in the evenings at home (according to their roster). They stack books and look and remove.” (Female, 46, Secondary School Parent)

“I prefer the A4 textbooks because I can pack my bag better. The A5 books are different widths and don’t fit next to one another properly, then the one side is heavier.” (Female, 17, Combined School Learner)

Increasing the physical activity levels of learners

Physical activity needs to be increased so that the learners are stronger and develop better physically as they grow up.

Teachers saw walking to school as a form of exercise that would strengthen learner’s backs and was particularly advocated for by senior teachers. Teachers also said that learners from poorer communities were more active as they walked to school and played outside more than sitting indoors to play on a computer or watch TV. Parents from richer communities said they enrolled pre-schoolers in *“Playball”* or *“Monkeynastix”* that helped stimulate physical activity and development. Principals said that they encouraged learners to participate in sports and the younger learners to play and run around during breaks. Teachers viewed Life Orientation as a way to enable learners to be more active as physical exercises had to be done to pass the subject.

“Lots of children have to walk to school, its good exercise.” (Female, 53, Primary School Teacher)

“We encourage our children to participate in at least one sport per season, they don’t have to do all of them, but we have many sports” (Male, 62, Primary School Principal)

“Children that don’t have all the technology to their disposal, they develop better than those that do have it to their disposal. Because instead of sitting inside for hours entertaining themselves, they will go outside and play with friends.” (Female, 33, Primary School Teacher)

“The little ones must run around during breaks, otherwise they get to class and can sit still and concentrate.” (Male, 62, Primary School Principal)

“Everyone participates in sports, all our children participate in sports – I mean, its Life Orientation, there are very few that don’t do it, but we give exercises twice a week for an hour.” (Female, 33, Primary School Teacher)

Encouraging learners to have good posture

Correct school furniture and encouraging learners to sit, stand and walk up straight will be greatly beneficial to them.

Parents and teachers encouraged learners to sit and stand up straight and not to slouch. Learners said that school desks had backrests that gave back support. Learners also said that the laboratory stools forced them to sit up straight as they didn’t have backrests to slouch against. Teachers said that they had tried to accommodate the senior grade learners with furniture more suited to their size, while the lower grade learners were equipped with desks and chairs for small children. Learners said that walking between classes helped to alleviate discomfort caused by continued sitting and allowed them sit more up straight.

“With the grade 1’s, before we do writing, we’ll say ‘sit up straight, feet together’. So you make them aware of it here. And you will walk past them and you will tell them, ‘no no, you can’t lie like that’ or ‘stand like that’ when they slouch.” (Female, 34, Primary School Teacher and Parent)

“The school desks are uncomfortable, but at least they have backrests. Not like the stools in the laboratories where you have to sit up straight because you can’t slouch against the backrest.” (Male, 18, Secondary School Learner)

“I judge desks for children. You don’t want them to sit in a desk that is too small.”
(Female, 61, Secondary School Learner)

“When you walk from one class to another your back feels a bit better and then you can sit for a while again.” (Female, 11, Primary School Learner)

2.3.2.3. Theme 3: Proposed Interventions for Spinal Health Barriers

This theme describes interventions proposed by participants to aid and improve the spinal health of learners. The proposed interventions are aimed at the identified barriers and how to address them and build upon the facilitators as discussed above. The proposals also include different content delivery methods for learners of different ages and why certain delivery methods would be better suited than others. All participants agreed that a lack of knowledge on spinal health was the biggest problem and that the most barriers could be addressed with appropriate education on the matter.

How to reduce the load of heavy school bags

Lessening the number of textbooks carried, either by having fewer subjects per day or being able to swap textbooks as needed, would be a good start to increasing spinal health. Although not yet thought to be feasible in South Africa, electronic devices would be the most efficient.

Participants said that the best way to tackle the heavy loads that learners carried was to reduce the number of textbooks. Immediate actions suggested by teachers were to encourage learners to pack their textbooks according to the day’s roster and that they be taught how to balance the loads in their schoolbags. Furthermore, they suggested lockers

where the textbooks could be stored safely, with the incentive that if their homework had been completed, the textbooks could be left at school. Teachers said that lockers would only be necessary for the Intermediate Phase and upwards, as Foundation Phase learners only had three subject books. Learners suggested that fewer subjects be taught in one day, stating that they would prefer longer periods of one subject if it meant that they were able to carry fewer books. Participants said that the ideal solution to lightening the loads would be to switch to electronic copies of textbooks on tablets but were sceptical about the feasibility thereof in South Africa.

“Children must just pack their books according to their schedules, they are allowed to.” (Male, 25, Intermediate School Teacher)

“They have to balance their bags on their backs. Pack the books to balance the weight.” (Female, 61, Secondary School Teacher)

“With lockers they can leave textbooks safely at school. They wouldn’t have to carry all the books all the time.” (Female, 23, Secondary School Teacher)

“I think the young ones must not be included in the locker thing because they don’t have textbooks that they carry around. It is just the red books and they are kept in the class because they stay in the same class the whole day. But from Grade 4 they change between classes and it’s them that have to carry lots of books.” (Female, 24, Intermediate School Teacher)

“Less subjects on one day is better. Then you have to bring less books.” (Male, 11, Primary School Learner)

“A tablet will help with all the books that are in your bag.” (Male, 17, Combined School Learner)

“If parents can’t even afford to buy their children food, yes there are children that go to school hungry, then how could you expect them to buy a tablet?” (Female, 48, Secondary School Teacher and Parent)

Knowledge of specific types of school bags

Learners are eager to gain more knowledge about different schoolbags and the correct methods of carrying the necessary loads.

Learners said that they wanted to know the advantages and disadvantages of the different types of schoolbags, and what the correct and incorrect ways in which to carry them were. The different types of schoolbags that learners said they wanted to learn about were bags with one and two shoulder straps, wheeled bags and handheld bags. Principals and teachers said that they would like to see a more affordable and durable schoolbag designed that would protect learners' backs as well as the textbooks. Parents said that learners should be taught the correct way of picking up schoolbags, regardless of the type of bag.

"There are all these different school bags, some have one strap or two, or maybe wheels and those orthopaedic ones. But what is the difference, why is one good and the other one bad?" (Female, 18, Combined School Learner)

"The people don't tell us how bad one strap or two straps are, they don't tell us the disadvantages of one strap and we carry it with two straps. So we never know which way is the best way." (Female, 17, Combined School Learner)

"The suitcases must, there must be a happy medium between protection for the books and protection for the child." (Male, 60, Combined School Principal)

"It doesn't matter what type of bag a child uses, if he doesn't pick it up right, it won't make a difference. They must pick them up properly, bend the knees, not the back, that sort of thing." (Male, 62, Primary and Secondary School Parent)

Methods to increase the physical activity of learners

Encouragement to play sport, being taught safe games and a revised Life Orientation curriculum could be the main contributors to increased physical activity in learners.

Participants felt that sport was very important for physically strengthening learners and that they should be encouraged to participate more. Teachers said that younger children specifically should be taught games that are safe to play and why games such as wrestling are not safe. Teachers also said that the Life Orientation curriculum should be revised to incorporate more physical activities to ensure that learners, who do not participate in sport, still receive sufficient exercise. Teachers further said that Life Orientation should also be used as a medium to teach learners specific exercises to help improve their posture. They also added that knowledge of spinal health must be included in the curriculum.

"I think sports are very important for children to develop strong bodies." (Female, 43, Secondary School Parent)

"You must give children games that are safe for them to play. Otherwise they will carry on playing that way and wrestling with one another." (Female, 58, Intermediate School Teacher)

"The knowledge must be part of life skills. We can bring it into healthy habits, all of us has that theme sometime during the year. And even as part of the physical education part of Life Orientation, I mean, there are all these activities they want us to do with the children, but they can also put some information there to also tell you why." (Female, 53, Primary School Teacher)

"I think if children were taught how to do abdominal exercises, to be more active, exercises to strengthen your body." (Female, 42, Primary & Secondary School Parent)

Reinforcing and aiding good postural habits

Education in good posture must be taught at home as well as at school. If stretch breaks during class are not possible, relaxation techniques would greatly aid learners, and this strategy should be promoted in all schools.

Teachers said that learners should be taught what good and bad postures in sitting, standing and walking entail. Learners added that they specifically wanted to know why certain postures were beneficial or not. Teachers said that promoting healthy posture, including sitting on a couch or working on a computer, should not be restricted to the schools, but should be initiated at home.

Learners felt the need to have short stretch breaks during class, which would alleviate discomfort from sitting for prolonged periods of time. Learners acknowledged that breaks were not always possible and said they would like to be taught relaxation techniques to enable to ease any discomfort encountered while sitting in class. One principal stated that he used stretch breaks in his classes and it increased the concentration and productivity of the learners and said that this reason should serve as justification for all teachers to implement the strategy.

“Everyone just always tells children to sit or stand up straight, but they might not know how to do that. You might have to teach them what those postures are.”
(Male, 27, Intermediate School Teacher)

“I would like to know more of what happens (to your back) when you get older, what will be the results. But it is important to start at home. Start at the parents and educate them on backs.” (Female, 31, Primary School Teacher and Parent)

“I think you must start in the Foundation Phase with how the child must sit and stand and walk their posture.” (Male, 27, Intermediate School Teacher)

“Why must I take care of my back? Why is this good and that bad?” (Male, 20, Secondary School Learner)

“Why must I take care of my back, or what will happen if I don’t take care of my back” (Female, 19, Secondary School Learner)

“A rest break (in class). Just to relax your muscles” (Male, 11, Primary School Learner)

“OK so we can’t always get breaks, you might be writing exams but then something else. How to sit, how to do something if you want to relax your muscles (while sitting).” (Male, 20, Secondary School Learner)

“Rest breaks where you just let them stand and stretch a bit, it improves their concentration. If teacher knew that, then they can’t have a problem with short breaks.” (Male, 62, Primary School Principal)

“Posture related (education) and give them enough reasons why they have to do it. Not just tell them “Do it”. They have to know if I do this, that is the consequences and if I don’t do it, then the likelihood exists that I will develop a back problem.” (Male, 34, Secondary School Teacher)

Educational spinal health programs to increase learners’ knowledge and awareness

A variety of platforms should be made available to educators (teachers and parents) to aid in promoting and implementing good spinal health with the learners. Visual stimulants, interactive presentations, puppetry and modern technology, together with health programs at the schools, would also greatly assist.

Participants said that all learners should be educated on all aspects of spinal health, but that different content delivery methods should be used for different age groups. Teachers and parents stated that they wouldn’t read through lengthy documents about spinal health, with parents preferring smaller group discussions where they could ask questions and teachers preferring short courses with practical demonstrations and pictures.

Learners said that they wanted to know how things worked and felt that they would understand better as to why and how to take care of their backs if they had a basic knowledge of spinal functions. Teachers and principals said that learners were more visually

inclined and that colourful pictures, and skeleton and practical demonstrations, in which they could take part, would have the greatest impact. Teachers suggested colourful posters about spinal health could be put up in schools to give repetitive and continued exposure but that the posters must be explained before being put up. Principals added that the placement of posters should be rotated to maximise exposure, as learners stop noticing posters after a while if they remain in the same positions.

Teachers and learners suggested that spinal health education form part of the Life Orientation curriculum. Learners also suggested Arts and Culture as an educational platform where learners could perform pieces depicting different aspects of spinal health to classmates. Parents suggested that puppet shows be used to educate the younger learners, stating that they always paid attention to puppets when they were at school.

Incorporating technology, parents suggested that a TV advertisement on spinal health be made, same as the 'save water' campaigns, using a similar slogan like *"save your back"*. Participants added that spinal health must be promoted in such a way that taking care of your back was seen as *"the cool thing to do"*. Parents and teachers felt strongly that spinal screening should be reintroduced and suggested it be managed like the vaccination program at the clinics, stating that it would be more *"proactive"* and would add a platform for educating parents on the subject.

"Everyone has to be educated. Because you can't have one person saying one thing and then another person saying something else, then the child won't know what's right. Everyone must have the same knowledge." (Female, 22, Secondary School Teacher)

"I think it must be done like this, a small group where you can talk and ask questions." (Female, 34, Primary School Parent)

"I think something like a course, a short course, where they give you practical demonstrations of the different things." (Female, 30, Secondary School Teacher)

"Our children just want to look at pictures. Colourful, big and no words" (Female, 42, Primary School Principal)

"If you show them something they can look at, like a skeleton that shows the bones, they can understand better." (Male, 25, Intermediate School Teacher)

"The children don't want to listen. But when I do practical and they have to do things, they remember everything." (Male, 54, Secondary School Teacher)

"It doesn't help you put a picture up and they think it's a picture of a skeleton man standing there, you have to tell them about it. Throughout the school we have the school's values put up and even that we rotate every 5 weeks so the pictures change, otherwise you don't notice it anymore." (Female, 42, Primary School Principal)

"Awareness programs and perhaps showing them. It's like telling the smoker and showing the lungs. I'm not always sure, but showing them what the outcomes could be." (Female, 61, Secondary School Teacher)

"Awareness is something that has to be done continuously. Until it becomes a habit it is something that has to be said continuously." (Female, 42, Primary School Principal)

"If we understand then we can do it better. If we know how the back works and how things go wrong then we can stop it from happening." (Female, 11, Primary School Learner)

"You can perform a drama piece that explains things to children, in Arts and Culture, the children can do the acting. These children like acting." (Female, 17, Secondary School Learner)

"I think, like from time to time there are puppet shows that come to entertain and make children aware of things. Maybe something like that would be good, if something like that came to make children aware of their health." (Female, 54, Primary School Parent)

“We watch TV, like with the news they give warnings about electricity and water usage. They must make one for your back too, that will help.” (Female, 47, Primary School Parent)

“If you can, like the children have to get their injections (vaccination program), if they get to that stage where the child is six, he’s going to school, then all the children go to look if their backs are functioning right. Or maybe earlier.” (Female, 30, Primary School Parent)

“It’s important to me that we have to educate people, to be proactive rather than reactive.” (Female, 42, Primary School Parent)

“When we were young someone would come to the school and check your spine and everything to check if it was right. They must do something like that again to screen for problems.” (Female, 42, Primary School Principal)

“Like when the children get their shots, vaccinations at the clinic, it’s a program, everyone has to do it. They can add the spinal health screening to those programs.” (Female, 46, Secondary School Parent)

2.4. DISCUSSION

This study was the first of its kind with the purpose of exploring and describing the perspectives of learners, teachers and parents/guardians as pertaining to spinal health of learners. This included barriers and facilitators of spinal health and proposed strategies of content delivery methods to promote spinal health in schools.

Demographic data

The participant profiles differed greatly, providing a diversified set of ideas and experiences. Participants’ ages ranged from 8 to 63 years. There was an overlap in the age ranges of the learners and the teachers with the oldest learners being the same age as the youngest teacher. This increased age range of learners could be due to some learners in South Africa

remaining in school for more school years until they have finished their schooling career, and some learners having to redo multiple grades. This age range of learners fell outside the age range of other studies researching spinal health in schools.[5,7,9,11-13] With no study commenting on learners being older than their peers, and only including children or adolescents, this could mean that this only occurs in countries similar to South Africa.

The gender percentages of this study were skewed with females making up 71% and males 29% of the participants. This skewed percentage was largely due to the parents and teachers' groups only having one and six males respectively. The reason for the low number of male parents could be due to them working and being unavailable, as most of the female participants were unemployed. The low number of male teachers participating in this study was reflective of the number of male teachers in the district, where less than a quarter of teachers in a school are male. The race of the study participants was predominantly coloured, which was consistent with the demographic profile of the district.[27] The sample size of the study was n=93. With sample sizes in qualitative research being determined by data saturation, a sample size calculation was not performed prior to the study. The sample size of this study was in line with those from other qualitative studies and with data saturation being obtained, no further sampling was needed.[28-29]

Barriers and facilitators as influencing factors

The barriers associated with self-care of spinal health, as described by participants, painted a negative and colourless picture. Firstly, the key findings included the lack of spinal health knowledge in general, and particularly regarding backpack types, carrying methods and correct postures. Secondly, the learners' schoolbags were too heavy, although adults had unsympathetic feelings regarding that as they went through the same situations when they

were at school. This was not dissimilar from other research studies that showed that children and adolescents were lacking in knowledge relating to spinal anatomy, spinal pathology and maximum schoolbag weight.[3,11] A lack of spinal health knowledge and inadequate instructions on spinal care during childhood and adolescence could result in poor postural habits, which could subsequently lead to pain and structural skeletal deformities.[3]

Furthermore, the long periods of sitting in class, together with the heavy schoolbags that they carried, was the learners' main concern. Lastly, the adults' main concerns were the sedentary lifestyles and lack of sport participation of learners. Due to the modern technological age, it was found that children and adolescents spent an increasing amount of time sitting in front of a television or computer, which enhances a passive lifestyle.[14,19] Incorrect posture, in addition to inefficient and harmful movement patterns while engaged with technology, supported the adults' opinions about the sedentary lifestyles of learners.[19]

These barriers were consistent with those found in other research studies, suggesting that South Africa is facing similar problems as other countries regarding the spinal health of learners.[3,7,11,20] However, South Africa has unique circumstances that differentiate the barriers as experienced by other countries. South Africa has a high proportion of low income families who are historically known to have less access to medicine, higher education and modern technology.[26-27] However, they are known to be physically stronger and healthier due to intense physical labour and more active lifestyles as children.[30] Also, South Africa has widely diversified indigenous cultures with their own principles which make it difficult for Western Culture to influence change within their societies.[31] The implication

of these findings is that there is a need for basic education as the rudimentary levels of spinal health knowledge are not being fulfilled, which would allow learners, parents and teachers to make informed decisions about learners' spinal health.

Any facilitators that promoted spinal health and back care of learners were sparse and minimally effective. The reduced efficacy was due to factors such as limited access to school lockers, inconsistent encouragement for proper backpack carriage and insufficient physical activity (exercise). Using lockers for textbooks was the first key facilitator identified by participants, being a prominent factor in reducing the weight of the learners' backpacks. The recommended cut-off weight for backpacks ranged from 10 to 15%, with an RBW of 15% appearing to be too heavy to maintain a correct standing posture.[15-16] By reducing the textbooks by even two, which could translate to 3kg, could change the RBW from 15 to 10%.[15] However, lockers were only available at some of the schools, and even then, were not sufficient for the number of learners attending the school.

Teachers and parents' encouragement of learners to sit and stand up straight, and to carry their schoolbags over both shoulders, was also seen as a facilitator. However, the encouragement was not given consistently and/or continuously. This was due to the adults being reserved about the carrying methods, as they themselves were unsure of what the best method of carrying schoolbags was. The learners felt that being told to sit up straight was hypocritical, as the people who told them to do so, weren't doing it themselves. Due to the inconsistency and hypocritical nature of these encouragements, learners were ignoring the teachers and parents, to the detriment of their own health benefit.

All the schools offered physical exercise as part of the Life Orientation (LO) curriculum and a variety of sporting activities. These facilitators encouraged the learners to be more

physically active. However, physical education mismanagement by teachers resulted in insufficient exercise during LO, and there were reservations of the abilities of the coaches to ensure safety while learners participated in sports. Combined with this, learners participating in sport while injured led to the reduction in the efficacy of any type of physical exercise. Physical activity and exercise as part of spinal health education is associated with improved back care.[11] Thus, by improving the physical education facilitators, the spinal health of learners can be improved.

With no published research reporting on facilitators in schools, it is difficult to determine whether this is new information, or not. However, with these facilitators only giving minimal assistance and not truly being effective in facilitating the spinal health of learners, it is questionable whether they can be true facilitators. Nevertheless, the facilitators act as a premise for intervention recommendations.

Suggestions to facilitate spinal health in schools

As learners are influenced by the people they interact with, education should perhaps not only be limited to learners, but also include parents and teachers, to ensure continued facilitation at home and at school. Parents can initiate learners' spinal health care at home while teachers have the opportunity to expand upon the education in class. It came to light that the difficulty in educating parents and teachers lies in them not wanting to read through lengthy documents or having to attend meetings after hours. A take home brochure of the most important aspects of spinal health, that makes use of pictures and is easily understandable, might be the best way to address these problems. An educational strategy would have to be devised to address each group's specific needs.

Taking into consideration that knowledge does not translate to significant behavioural changes, by understanding the views of participants on potential interventions, we gain the knowledge to fill the gaps of previous interventions, specifically focussing on behavioural changes and not just knowledge enhancement.[4,6] Learners made it clear that they wanted to know the “why” aspects of spinal care and this was perhaps the reason for not seeing significant behavioural changes after spinal health education was given. Multiple studies have shown improvement in children’s and adolescents’ spinal health knowledge through educational programs and these programs should be assessed for use or adaptation to a uniquely South African population.[3-4,6]

By compiling the participants’ suggestions and experiences on what they deemed the best ways to educate learners, an outline of how they believed spinal health education should be done could be suggested. Spinal health educational programs should form part of the Life Orientation curriculum, with education starting in the Foundation Phase to encourage healthy behaviour from a young age. The education program must be age specific and be expanded each year throughout all schooling phases, which is consistent with what other studies have found.[3,6,11,32]

Education should consist of two types: theory sessions to improve knowledge, and practical sessions for favourable behaviour changes. The theory can focus on giving the learners the knowledge required for proper spinal health, by making use of visual stimulus, such as colourful pictures. The incidence of child and adolescent LBP can be reduced by education.[6,11] The practical sessions could make use of demonstrations, linked to the theory, which will allow learners to physically feel and learn the movements of correct and healthy spinal behaviour.

Posters should be used as part of continued exposure to reinforce healthy behaviour. Explanations of the posters can be part of the theory sessions and then be placed throughout the schools.. Each poster must preferably focus on one topic with colourful pictures and minimal to no writing. Poster positions must also be rotated throughout the school buildings on a regular basis to have greater exposure. This educational outline will ensure lifelong exposure and have the greatest impact on the cognitive aspects of learners' spinal health.[3,6,11,32] By combining both theoretical knowledge and physical education the impact on learners' spinal health behaviour will be greatly improved.

Limitations

Many study limitations need to be considered. Firstly, the limited number of male participants could have skewed the results to a more female perspective. Secondly, no formal socio-economic assessment was done which could have been used to interpret the influences associated with higher and lower income classes separately which would allow for more accurate transferability due to the divers socio-economic spectrum in South Africa. Thirdly, with the study being done predominantly in Afrikaans and the Afrikaans quotes and interpretations being translated to English by the researcher, some content depth could have been lost in the process. The researcher's personal characteristics (age, gender and occupation) may also have influenced the interpretation and outcomes of the data. The researcher's age might have influenced the older participants as they could have viewed her as inexperienced. The gender difference might have made some males (or even some females) uncomfortable and less open to discussions. The researcher's profession could have led participants to answering questions based on what they thought a physiotherapist does and not their own experiences. However, this could also have made participants more

comfortable to share experiences due to the researcher being a professional. Lastly, the researcher's misconception of topics influenced the data extraction from participants during the initial interviews. This led to relevant and important information not being properly explored until later interviews were conducted.

Future Research and considerations

Future research should focus on development and implementation of spinal health educational programs by pilot testing spinal health educational programs in South African Schools including all grades. The use of physiotherapists to perform assessments and screening of learners' spinal health could assist with the prevention of spinal health related issues and should be considered for implementation in schools as well as being assessed for economic feasibility in South Africa taking into consideration the cost of preventions compared to the cost of treatments for adults with spinal health problems. Research is also needed on the effectiveness of different delivery methods for different ages aimed at long term effectiveness. Clinicians and therapists should consider knowledge, behaviour and exercise when treating learners with LBP for a wholistic intervention. There is a need to define the term "spinal health" to clarify the concept as either "a state of complete physical, social and mental well-being, not merely the absence of disease or infirmity" [33] or as "the ability to adapt and self-manage in the face of social, physical, and emotional challenges" [34].

Policy changes

There is a need for spinal health education to be included in the Life Orientation curriculum starting in the Foundation Phase. There is a further need to increase the physical education

and exercise of the Life Orientation curriculum. In conjunction with educational needs, there is a need for spinal health screening and assessment programs in clinics and schools which would require collaboration between the South African national Departments of Health and Education. Physiotherapist could be implored to assist with these screenings and assessments. When looking at sport, age specific regulations need to be considered to improve the safety thereof.

2.5. CONCLUSION

The prevalence of LBP amongst adolescents can be as high as 70%, depending on research design and pain definition. The aim of the study was to explore the perspectives of learners, teachers and parents/guardians on the spinal health of learners. The barriers emphasized by participants showed that there were problems with the spinal health of learners that needed to be addressed with particular emphasis on knowledge gaps. The facilitators showed that barriers could be addressed but that the current facilitators weren't sufficient. One such example would be the lockers that are available at some schools. The participants' proposed interventions gave plausible solutions to address the learners' spinal health barriers and to enhance the effectiveness of the facilitators. Clinicians and therapists should consider knowledge, behaviour and exercise when treating learners with LBP for a wholistic intervention. Further research is needed on the effectiveness of different delivery methods for different ages aimed at long term effectiveness. Future research should also focus on development and implementation of spinal health educational programs by pilot testing spinal health educational programs in South African Schools including all grades.

2.6. ACKNOWLEDGEMENTS

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CHAPTER 3: Summary

Low back pain (LBP) is a common cause of morbidity worldwide, affecting people of all ages.[1-2] Although the economically active stratum of the population is most affected, an increasing number of children and adolescents experience LBP.[1] In order to improve the effectiveness of spinal health educational programs, in an effort to improve spinal behaviour of children and adolescents, research is needed to identify and explore the reasons why changes are stunted. To assist with the development of spinal health promotion strategies, the current perspectives and knowledge of different socio-economic societies and cultures need to be explored.

To our knowledge there are no published qualitative studies to explore LBP and poor spinal health in schools. There is a lack of published research about child and adolescent spinal health in South African Schools. Also, research is needed to improve school based spinal health and preventative strategies. Knowledge of uniquely South African perspectives about spinal health of children and adolescents is necessary, due to the differences in educational systems, compared to other countries and to ensure that interventions are context specific.

The purpose of this study was to explore what the perspectives of learners (children and adolescents), teachers and parents/guardians were on the spinal health of learners in the Langeberg Municipal District of South Africa. The objectives for the study were to explore and describe barriers and facilitators for the promotion of spinal health and to describe strategies and delivery methods to promote spinal health in schools. The findings of this study will help raise awareness of spinal health and help prevent child and adolescent LBP. The findings can also be used in conjunction with other studies' results to improve on educational back care programs for learners.

A descriptive qualitative case study design with an interpretative and phenomenological approach was used. Ninety-three participants were purposively sampled and participated in In-Depth Interviews (IDI's) or Focus Group Discussions (FGD's). A specific line of questioning was followed for all participants. All IDI's and FGD's were recorded and transcribed by the principle researcher. Analysis was done from the transcripts and inductive reasoning was used to explore the phenomena of spinal health in learners. Transcripts were coded based on initial and subsequent emerging themes.

Three main themes emerged from the data: Barriers associated with self-care of spinal health; Facilitators to assist with Spinal Health and Back care; and Proposed Interventions for Spinal Health Barriers. The barriers associated with self-care of spinal health, as described by participants, painted a negative and colourless picture and those emphasized by participants showed that there were problems with the spinal health of learners that needed to be addressed. The key barriers identified by participants included the lack of spinal health knowledge in general, and particularly regarding backpack types, carrying methods and correct postures. The long periods of sitting in class, together with the heavy schoolbags that they carried, were the learners' main concern. The adults' main concerns were the sedentary lifestyles and lack of sport participation of learners.

The facilitators showed that barriers could be addressed but that the current facilitators weren't sufficient. Any facilitators that promoted spinal health and back care of learners were sparse and minimally effective. The reduced efficacy was due to factors such as limited access to school lockers, inconsistent encouragement for proper backpack carriage and insufficient physical activity (exercise). The participants' proposed interventions gave plausible solutions to address the learners' spinal health barriers and to enhance the

effectiveness of the facilitators. The participants believed that most of the barriers could be addressed through proper education. Education must consist of two types: theory sessions to improve knowledge, and practical sessions for favourable behaviour changes. The theory must focus on giving the learners the knowledge required for proper spinal health, by making use of visual stimulus, such as colourful pictures. The practical sessions must make use of demonstrations, linked to the theory, which will allow learners to physically feel and learn the movements of correct and healthy spinal behaviour.

There is a need for spinal health education to be included in the Life Orientation curriculum starting in the Foundation Phase and to be age specific. There is a further need to increase the physical education and exercise of the Life Orientation curriculum. When looking at sport, age specific regulations need to be considered to improve the safety thereof. Further research is needed on the effectiveness of different content delivery methods for different ages aimed at long term effectiveness. Future research should also focus on development and implementation of spinal health educational programs, by pilot testing spinal health educational programs in South African Schools, including all grades. Clinicians and therapists should consider knowledge, behaviour and exercise when treating learners with LBP for a wholistic intervention.

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APPENDICES

Appendix 1: WORK journal specifics for publication

Preparation of manuscripts:

1. Manuscripts must be written in English. Authors whose native language is not in English are recommended to seek the advice of a native English speaker, if possible, before submitting their manuscripts. Please use person first language; that is a person with an injury, not an injured person. Peerwith offers a language and copyediting service to all scientists who want to publish their manuscript in scientific peer-reviewed periodicals and books.

2. Manuscripts should be typed on one side of the paper only, with wide margins and double spacing throughout. For the electronic file of the text you may use any standard word processor. Do not use page layout software and do not send PostScript files of the text. The preferred length of a manuscript is 20-30 pages double spaced (not including references, tables or figures), Typically, the journal only publishes data collected within the past 5 years. Include the degree to which your paper builds on and advances on knowledge published within WORK.

3. Manuscripts should use wide margins and double spacing throughout, including the abstract, footnotes and references. Every page of the manuscript, including the title page, references, tables, etc., should be numbered. However, in the text no reference should be made to page numbers; if necessary, one may refer to sections. Try to avoid the excessive use of italics and bold face.

4. Manuscripts should be organized in the following order:

- Title page
- Introduction
- Body of text (divided by subheadings)
- Conclusion
- Acknowledgements
- References
- Tables
- Figure captions
- Figures

5. Headings

Headings and subheadings should be numbered and typed on a separate line, without indentation. SI units should be used, i.e., the units based on the metre, kilogramme, second, etc.

6. Title page

- The title page should provide the following information:
- Title (should be clear, descriptive and not too long)
- Name(s) of author(s); please indicate who is the corresponding author
- Full affiliation(s)
- Present address of author(s), if different from affiliation
- Complete address of corresponding author, including tel. no., fax no. and e-mail address
- Abstract
- Keywords (3-5 words not in your title)

7. Abstract

The abstract should be clear, descriptive, self-explanatory and not longer than 200 words, it should also be suitable for publication in abstracting services. The abstract for research papers should follow the “structured abstract” format. Section labels should be in bold uppercase letters followed by a colon, and each section will begin on a new line.

BACKGROUND:

OBJECTIVE:

METHODS:

RESULTS:

CONCLUSIONS:

8. Tables

- Tables should be numbered according to their sequence in the text. The text should include references to all tables.
- Each table should be provided on a separate page of the manuscript. Tables should never be included in the text.
- Each table should have a brief and self-explanatory title.
- Column headings should be brief, but sufficiently explanatory. Standard abbreviations of units of measurement should be added between parentheses.
- Vertical lines should not be used to separate columns. Leave some extra space between the columns instead.
- Any explanations essential to the understanding of the table should be given in footnotes at the bottom of the table.
- Table captions should be provided all together on a separate sheet.

9. Figures

- Figures should be numbered according to their sequence in the text. The text should include references to all figures.
- Each figure should be provided on a separate sheet. Figures should not be included in the text.
- Color figures can be included, provided the cost of their reproduction is paid for by the author.
- For the file formats of the figures please take the following into account: line art should be have a minimum resolution of 600 dpi, save as EPS or TIFF greyscale (incl photos) should have a minimum resolution of 300 dpi (no lettering), or 500 dpi (when there is lettering); save as tiff do not save figures as JPEG, this format may lose information in the process; do not use figures taken from the Internet, the resolution will be too low for printing; do not use colors in your figures if they should be printed in black & white, because this will reduce the print quality (note that in software often the default is color, you should change the settings)
- For figures that should be printed in color, please send both a hard copy (to be used for the paper publication), and a CMYK encoded EPS or TIFF (used for the electronic publication)
- Each figure should be identified by its number. If necessary, indicate top or bottom of figure.
- Figures should be designed with the format of the page of the journal in mind. They should be of such a size as to allow a reduction of 50 %.
- On maps and other figures where a scale is needed, use bar scales rather than numerical ones, i.e., do not use scales of the type 1:10,000. This avoids problems if the figures need to be reduced.

- Each figure should have a self-explanatory caption. The captions to all figures should be typed on a separate sheet of the manuscript.
- Photographs are only acceptable if they have good contrast and intensity
- Each illustration should be provided on a separate sheet. Illustrations should not be included in the text. The original drawings (no photocopies) are required. Electronic files of illustrations should preferably be formatted in Encapsulated PostScript Format.
- Footnotes should be kept to a minimum, and they should be provided all together on a separate sheet.

10. References

The reference style for WORK is Vancouver style

1. Place citations as numbers in square brackets in the text. All publications cited in the text should be presented in a list of references following the text of the manuscript. Only articles published or accepted for publication should be listed in the reference list. Submitted articles can be listed in the text as (author(s), unpublished data).

2. All authors should be listed in the reference list.

3. References must be listed in Vancouver style:

[1] Rose ME, Huerbin MB, Melick J, Marion DW, Palmer AM, Schiding JK, Kochanek PM, Graham SH. Regulation of interstitial excitatory amino acid concentrations after cortical contusion injury. *Brain Res.* 2002; 935(12): 406.

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11. Footnotes

- Footnotes should only be used if absolutely essential. In most cases it is possible to incorporate the information in the text.
- If used, they should be numbered in the text, indicated by superscript numbers and kept as short as possible

12. Copyright

Authors submitting a manuscript do so on the understanding that if their paper is accepted for publication, copyright in the article, including the right to reproduce the article in all forms and media, shall be assigned exclusively to the Publisher.

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14. Proofs

The corresponding author is asked to check the galley proofs (the publisher will execute a cursory check only). Corrections other than printer's errors, however, should be avoided. Costs arising from such corrections will be charged to the authors.

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Appendix 2: Ethics Approval



UNIVERSITEIT • STELLENBOSCH • UNIVERSITY
jou kennisvennoot • your knowledge partner

Approval Notice Response to Modifications- (New Application)

31-Jan-2017
Kriel, R?na RI

Ethics Reference #: S16/10/187

Title: Perspectives of Spinal Health in School-going Children and Adolescents in the Langeberg Municipal District of South Africa: a Qualitative Study

Dear Miss R?na Kriel,

The **Response to Modifications - (New Application)** received on 13-Jan-2017, was reviewed by members of Health Research Ethics Committee 1 via Expedited review procedures on 24-Jan-2017 and was approved.

Please note the following information about your approved research protocol:

Protocol Approval Period: 31-Jan-2017 -30-Jan-2018

Please remember to use your **protocol number** (S16/10/187) on any documents or correspondence with the HREC concerning your research protocol.

Please note that the HREC has the prerogative and authority to ask further questions, seek additional information, require further modifications, or monitor the conduct of your research and the consent process.

After Ethical Review:

Please note a template of the progress report is obtainable on www.sun.ac.za/rds and should be submitted to the Committee before the year has expired. The Committee will then consider the continuation of the project for a further year (if necessary). Annually a number of projects may be selected randomly for an external audit.

Translation of the consent document to the language applicable to the study participants should be submitted.

Federal Wide Assurance Number: 00001372

Institutional Review Board (IRB) Number: IRB0005239

The Health Research Ethics Committee complies with the SA National Health Act No.61 2003 as it pertains to health research and the United States Code of Federal Regulations Title 45 Part 46. This committee abides by the ethical norms and principles for research, established by the Declaration of Helsinki, the South African Medical Research Council Guidelines as well as the Guidelines for Ethical Research: Principles Structures and Processes 2004 (Department of Health).

Provincial and City of Cape Town Approval

Please note that for research at a primary or secondary healthcare facility permission must still be obtained from the relevant authorities (Western Cape Department of Health and/or City Health) to conduct the research as stated in the protocol. Contact persons are Ms Claudette Abrahams at Western Cape Department of Health (healthres@pgwc.gov.za Tel: +27 21 483 9907) and Dr Helene Visser at City Health (Helene.Visser@capetown.gov.za Tel:

+27 21 400 3981). Research that will be conducted at any tertiary academic institution requires approval from the relevant hospital manager. Ethics approval is required BEFORE approval can be obtained from these health authorities.

We wish you the best as you conduct your research.

For standard HREC forms and documents please visit: www.sun.ac.za/rds

If you have any questions or need further assistance, please contact the HREC office at .

Included Documents:

NRF Student support agreement.pdf

Declaration Q Louw.pdf

Checklist.pdf

CV Q Louw.doc

20161201 MOD ICF parent of learner.pdf

Declaration R Kriel.pdf

20161201 MOD Child Assent Form.pdf

Application form.pdf

20170123 MOD2 ICF parent of learner.pdf

20170123 MOD 2 Cover letter (2) S16-10-187.docx

20161201 MOD ICF FGDs teacher_parents.pdf

20161201 MOD ICF IDI pricipals.pdf

20170123 MOD2 HREC Modifications Required.pdf

20170123 MOD2 ICF FGDs parents.pdf

Synopsis.pdf

CV Y Brink.pdf

CV R Kriel.pdf

Protocol.pdf

Declaration Y Brink.pdf

20161128 MOD HREC Modifications Required letter

Sincerely,

Franklin Weber

HREC Coordinator

Health Research Ethics Committee 1

Appendix 3: Western Cape Education Department Approval



Directorate: Research

Audrey.wyngaard@westerncape.gov.za

tel: +27 021 467 9272

Fax: 0865902282

Private Bag x9114, Cape Town, 8000

wced.wcape.gov.za

REFERENCE: 20170303 –8817

ENQUIRIES: Dr A.T Wyngaard

Ms Réna Kriel
Witklei
PO Box 210
Montagu
6720

Dear Ms Réna Kriel

RESEARCH PROPOSAL: PERSPECTIVES OF SPINAL HEALTH IN SCHOOL-GOING CHILDREN AND ADOLESCENTS IN THE LANGEBERG MUNICIPAL DISTRICT OF SOUTH AFRICA: A QUALITATIVE STUDY

Your application to conduct the above-mentioned research in schools in the Western Cape has been approved subject to the following conditions:

1. Principals, educators and learners are under no obligation to assist you in your investigation.
2. Principals, educators, learners and schools should not be identifiable in any way from the results of the investigation.
3. You make all the arrangements concerning your investigation.
4. Educators' programmes are not to be interrupted.
5. The Study is to be conducted from **06 March 2017 till 29 September 2017**
6. No research can be conducted during the fourth term as schools are preparing and finalizing syllabi for examinations (October to December).
7. Should you wish to extend the period of your survey, please contact Dr A.T Wyngaard at the contact numbers above quoting the reference number?
8. A photocopy of this letter is submitted to the principal where the intended research is to be conducted.
9. Your research will be limited to the list of schools as forwarded to the Western Cape Education Department.
10. A brief summary of the content, findings and recommendations is provided to the Director: Research Services.
11. The Department receives a copy of the completed report/dissertation/thesis addressed to:
**The Director: Research Services
Western Cape Education Department
Private Bag X9114
CAPE TOWN
8000**

We wish you success in your research.

Kind regards.

Signed: Dr Audrey T Wyngaard

Directorate: Research

DATE: 03 March 2017

Appendix 4: Informed Consent Form for Principals



STELLENBOSCH UNIVERSITY

Division of Physiotherapy • Department of Health Sciences •
Faculty of Medicine and Health Sciences • P.O. Box 19063 • Tygerberg 7505



Study Title: Perspectives of Spinal Health in School-going Children and Adolescents in the Langeberg Municipal District of South Africa: a Qualitative Study

Ethics Reference #: S16/10/187

Principal Investigator: Réna Kriel

Dear Prospective Participant

You are being invited to take part in a research project. Please take some time to read the information presented here, which will explain the details of this project. Please ask the study staff any questions about any part of this project that you do not fully understand. It is very important that you are fully satisfied that you clearly understand what this research entails and how you could be involved. Also, your participation is **entirely voluntary** and you are free to decline to participate. If you say no, this will not affect you negatively in any way whatsoever. You are also free to withdraw from the study at any point, even if you do agree to take part.

This study has been approved by the Health Research Ethics Committee at Stellenbosch University and will be conducted according to the ethical guidelines and principles of the international Declaration of Helsinki, South African Guidelines for Good Clinical Practice and the Medical Research Council (MRC) Ethical Guidelines for Research.

What this research study is all about

Research has shown that back problems amongst school children are on the rise. We want to know why and what can be done about it. The study is researching the back health and care of children in the Langeberg Municipal District's schools (Ashton, Bonnievale, McGregor, Montagu & Robertson areas).

We are going to be doing interviews and discussion groups with teachers, parents and children as to get everyone's opinions. Initially we will do 6 interviews and hold 9 discussion groups, but interviews and discussions will continue until no new information is obtained. The interviews will be one-on-one and will take 30-45minutes. The discussions will consist of up to 10 participants and will take 60-90minutes. The groups will only be either teachers, parents or children and not a mixture of the lot and children will be divided by grade as to separate junior from senior grades. All interviews and discussions will be recorded for better analysis by the researchers.

Why you have been invited to participate

You have been invited to participate because you are a principal of a school in the Langeberg Municipal District.

What your responsibilities will be

As a participant you will take part in an interview question and answer session and do not have any additional responsibilities. You do not need to study or read any additional information as we want to know what your perspectives and experiences on the topic are.

Benefits and costs for taking part in this research study

There is no direct benefit to you as a participant as this study aims to help learners in the future. Participants will not be paid to take part in the study but adult participants will be compensated for their time and effort in the form of vouchers if you do take part. There are no additional costs to you as a participant and transport costs will be reimbursed.

Risks involved in taking part in this research study

There are no risks involved in participating. No sensitive questions will be asked.

Who will have access to records and information?

All information collected will be treated as confidential. Personal information will not be shared as to maintain anonymity. Recordings will be stored on a password protected computer and paperwork will be stored in a locked office for protection. All names will be removed from the recording transcripts and recordings will be destroyed on completion of this study. Only the researchers will have access to data and information obtained and members of the Ethics Committee may inspect records to ensure that the research is being done according to guidelines.

Additional information and contact details

You can contact **Réna Kriel** at **072 861 9191** if you have any further queries or encounter any problems.

You can contact the **Health Research Ethics Committee** at **021-938 9207** if you have any concerns or complaints that have not been adequately addressed by your study researcher.

You will receive a copy of this information and consent form for your own records.

Declaration by participant

By signing below, I agree to take part in a research study entitled *Perspectives of Spinal Health in School-going Children and Adolescents in the Langeberg Municipal District of South Africa: a Qualitative Study.*

I declare that:

- I have read or had read to me this information and consent form and it is written in a language with which I am fluent and comfortable.
- I have had a chance to ask questions and all my questions have been adequately answered.
- I understand that taking part in this study is voluntary and I have not been pressurised to take part.
- I may choose to leave the study at any time and will not be penalised or prejudiced in any way.
- I may be asked to leave the study before it has finished, if the study doctor or researcher feels it is in my best interests, or if I do not follow the study plan, as agreed to.
- The interview or discussion may be recorded.

Signed at (*place*) on (*date*)

.....

.....

Signature of participant

Signature of witness

Declaration by investigator

I (*name*) declare that:

- I explained the information in this document to
- I encouraged him/her to ask questions and took adequate time to answer them.
- I am satisfied that he/she adequately understands all aspects of the research, as discussed above.

Signed at (*place*) on (*date*)

.....

.....

Signature of investigator

Signature of witness

Appendix 5: Informed Consent Form for Teachers



STELLENBOSCH UNIVERSITY

Division of Physiotherapy • Department of Health Sciences •
Faculty of Medicine and Health Sciences • P.O. Box 19063 • Tygerberg 7505



Study Title: Perspectives of Spinal Health in School-going Children and Adolescents in the Langeberg Municipal District of South Africa: a Qualitative Study

Ethics Reference #: S16/10/187

Principal Investigator: Réna Kriel

Dear Prospective Participant

You are being invited to take part in a research project. Please take some time to read the information presented here, which will explain the details of this project. Please ask the study staff any questions about any part of this project that you do not fully understand. It is very important that you are fully satisfied that you clearly understand what this research entails and how you could be involved. Also, your participation is **entirely voluntary** and you are free to decline to participate. If you say no, this will not affect you negatively in any way whatsoever. You are also free to withdraw from the study at any point, even if you do agree to take part.

This study has been approved by the Health Research Ethics Committee at Stellenbosch University and will be conducted according to the ethical guidelines and principles of the international Declaration of Helsinki, South African Guidelines for Good Clinical Practice and the Medical Research Council (MRC) Ethical Guidelines for Research.

What this research study is all about

Research has shown that back problems amongst school children are on the rise. We want to know why and what can be done about it. The study is researching the back health and care of children in the Langeberg Municipal District's schools (Ashton, Bonnievale, McGregor, Montagu & Robertson areas).

We are going to be doing interviews and discussion groups with teachers, parents and children as to get everyone's opinions. Initially we will do 6 interviews and hold 9 discussion groups, but interviews and discussions will continue until no new information is obtained. The interviews will be one-on-one and will take 30-45minutes. The discussions will consist of up to 10 participants and will take 60-90minutes. The groups will only be either teachers, parents or children and not a mixture of the lot and children will be divided by grade as to separate junior from senior grades. All interviews and discussions will be recorded for better analysis by the researchers.

Why you have been invited to participate

You have been invited to participate because you are a teacher at a school in the Langeberg Municipal District.

What your responsibilities will be

As a participant you will take part in a discussion group and answer some questions.

Benefits and costs for taking part in this research study

There is no direct benefit to you as a participant as this study aims to help learners in the future. Participants will not be paid to take part in the study but adult participants will be compensated for their time and effort in the form of vouchers if you do take part. There are no additional costs to you as a participant and transport costs will be reimbursed.

Risks involved in taking part in this research study

There are no risks involved in participating. No sensitive questions will be asked.

Who will have access to records and information?

All information collected will be treated as confidential. Personal information will not be shared as to maintain anonymity. Recordings will be stored on a password protected computer and paperwork will be stored in a locked office for protection. All names will be removed from the recording transcripts and recordings will be destroyed on completion of this study. Only the researchers will have access to data and information obtained and members of the Ethics Committee may inspect records to ensure that the research is being done according to guidelines.

Additional information and contact details

You can contact **Réna Kriel** at **072 861 9191** if you have any further queries or encounter any problems.

You can contact the **Health Research Ethics Committee** at **021-938 9207** if you have any concerns or complaints that have not been adequately addressed by your study researcher.

You will receive a copy of this information and consent form for your own records.

Declaration by participant

By signing below, I agree to take part in a research study entitled *Perspectives of Spinal Health in School-going Children and Adolescents in the Langeberg Municipal District of South Africa: a Qualitative Study.*

I declare that:

- I have read or had read to me this information and consent form and it is written in a language with which I am fluent and comfortable.
- I have had a chance to ask questions and all my questions have been adequately answered.
- I understand that taking part in this study is voluntary and I have not been pressurised to take part.
- I may choose to leave the study at any time and will not be penalised or prejudiced in any way.
- I may be asked to leave the study before it has finished, if the study doctor or researcher feels it is in my best interests, or if I do not follow the study plan, as agreed to.
- The interview or discussion may be recorded.

Signed at (*place*) on (*date*)

.....

.....

Signature of participant

Signature of witness

Declaration by investigator

I (*name*) declare that:

- I explained the information in this document to
- I encouraged him/her to ask questions and took adequate time to answer them.
- I am satisfied that he/she adequately understands all aspects of the research, as discussed above.

Signed at (*place*) on (*date*)

.....

.....

Signature of investigator

Signature of witness

Appendix 6: Informed Consent Form for Parents/Guardians



STELLENBOSCH UNIVERSITY

Division of Physiotherapy • Department of Health Sciences •
Faculty of Medicine and Health Sciences • P.O. Box 19063 • Tygerberg 7505



Study Title: Perspectives of Spinal Health in School-going Children and Adolescents in the Langeberg Municipal District of South Africa: a Qualitative Study

Ethics Reference #: S16/10/187

Principal Investigator: Réna Kriel

Dear Prospective Participant

You are being invited to take part in a research project. Please take some time to read the information presented here, which will explain the details of this project. Please ask the researcher any questions about any part of this project that you do not fully understand. It is very important that you clearly understand what this research entails and how you could be involved. Also, your participation is **completely your choice** and is not required. You are free to say “no” to participate. Saying “no” will not affect you negatively in any way. You are also free to withdraw from the study at any point.

This study has been approved by the Health Research Ethics Committee at Stellenbosch University. It will be done according to the ethical guidelines and principles of the international Declaration of Helsinki, South African Guidelines for Good Clinical Practice and the Medical Research Council (MRC) Ethical Guidelines for Research.

What this research study is all about

Research has shown that back problems amongst school children are on the rise. We want to know why and what can be done about it. The study is researching the back health and care of children in the Langeberg Municipal District’s schools (Ashton, Bonnievale, McGregor, Montagu & Robertson areas).

We are going to do interviews and discussion groups with teachers, parents and children as to get everyone’s opinions. At first we will do 6 interviews and hold 9 discussion groups. Interviews and discussions will continue until no new information is received.

The interviews will be one-on-one and will take 30-45minutes. The discussions will consist of up to 10 people and will take 60-90minutes. The groups will only be teachers, parents or children and not a mixture. Children will be divided by grade to separate junior from senior grades. Interviews and discussions will be recorded for better analysis by the researchers.

Why you have been invited to participate

You have been invited to participate because you are a parent of child in a Langeberg Municipal District school.

What your responsibilities will be

As a participant, you will answer some questions in a discussion group.

Benefits and costs for taking part in this research study

There is no direct benefit to you as a participant as this study aims to help learners in the future. Participants will not be paid to take part in the study. You will be compensated for your time and effort in the form of vouchers if you do take part. There are no additional costs to you as a participant and transport costs will be reimbursed.

Risks involved in taking part in this research study

There are no risks involved in participating. No sensitive questions will be asked.

Who will have access to records and information?

All information collected will be treated as private. Personal information will not be shared as to maintain anonymity. Recordings will be stored on a password protected computer. Paperwork will be stored in a locked office for protection. All names will be removed from the recording transcripts. Recordings will be destroyed on completion of this study.

Only the researchers will have access to data and information received. Members of the Ethics Committee may inspect records to make sure that the research is being done according to guidelines.

Additional information and contact details

You can contact **Réna Kriel** at **072 861 9191** if you have any further questions or have any problems.

You can contact the **Health Research Ethics Committee** at **021-938 9207** if you have any concerns or complaints that have not been adequately addressed by the researcher.

You will receive a copy of this information and consent form for your own records.

Declaration by participant

By signing below, I agree to take part in a research study entitled *Perspectives of Spinal Health in School-going Children and Adolescents in the Langeberg Municipal District of South Africa: a Qualitative Study.*

I declare that:

- I have read or had read to me this information and consent form and it is written in a language with which I am fluent and comfortable.
- I have had a chance to ask questions and all my questions have been adequately answered.
- I understand that taking part in this study is voluntary and I have not been pressurised to take part.
- I may choose to leave the study at any time and will not be penalised or prejudiced in any way.
- I may be asked to leave the study before it has finished, if the study doctor or researcher feels it is in my best interests, or if I do not follow the study plan, as agreed to.
- The interview or discussion may be recorded.

Signed at (*place*) on (*date*)

.....

.....

Signature of participant

Signature of witness

Declaration by investigator

I (*name*) declare that:

- I explained the information in this document to
- I encouraged him/her to ask questions and took adequate time to answer them.
- I am satisfied that he/she adequately understands all aspects of the research, as discussed above.

Signed at (*place*) on (*date*)

.....

.....

Signature of investigator

Signature of witness

Appendix 7: Informed Consent Form for Parents of Learner Participants



STELLENBOSCH UNIVERSITY

Division of Physiotherapy • Department of Health Sciences •
Faculty of Medicine and Health Sciences • P.O. Box 19063 • Tygerberg 7505



Study Title: Perspectives of Spinal Health in School-going Children and Adolescents in the Langeberg Municipal District of South Africa: a Qualitative Study

Ethics Reference #: S16/10/187

Principal Investigator: Réna Kriel

Dear Parent

Your child is being invited to take part in a research project. Please take some time to read the information presented here, which will explain the details of this project. Please ask the researcher any questions about this project that you do not fully understand. It is very important that you clearly understand what this research involves and how your child could be involved. Also, your child's participation is **completely your choice** and is not required. You are free to say "no" to have your child participate. Saying "no" will not affect you or your child negatively in any way. Your child is also free to withdraw from the study at any point.

This study has been approved by the Health Research Ethics Committee at Stellenbosch University. It will be done according to the ethical guidelines and principles of the international Declaration of Helsinki, South African Guidelines for Good Clinical Practice and the Medical Research Council (MRC) Ethical Guidelines for Research.

What this research study entails

Research has shown that back problems among school children are increasing. We want to know why and what can be done about it. The study is researching the back health and care of children in the Langeberg Municipal District's schools. (Ashton, Bonnievale, McGregor, Montagu & Robertson areas).

We are going to do interviews and discussion groups with teachers, parents and children as to get everyone's opinions. At first we will do 6 interviews and hold 9 discussion groups. Interviews and discussions will continue until no new information is received.

The interviews will be one-on-one and will take 30-45minutes. The discussions will consist of up to 10 people and will take 60-90minutes. The groups will only be teachers, parents or children and not a mixture. Children will be divided by grade to separate junior from senior grades. Interviews and discussions will be recorded for better analysis by the researchers.

Why has my child been invited?

Your child has been invited to take part because he/she is a learner of a school in the Langeberg Municipal District.

What will my child be responsible for?

As a participant, your child will answer some questions in a discussion group.

Benefits and costs for taking part in this study

There is no direct benefit to your child as this study aims to help learners in the future.

Risks involved in taking part in this study

There are no risks involved in participating. No sensitive questions will be asked.

Who will have access to records and information?

All information collected will be treated as private. Personal information will not be shared as to maintain anonymity. Recordings will be stored on a password protected computer. Paperwork will be stored in a locked office for protection. All names will be removed from the recording transcripts. Recordings will be destroyed on completion of this study.

Only the researchers will have access to data and information received. Members of the Ethics Committee may inspect records to make sure that the research is being done according to guidelines.

Additional information and contact details

You can contact **Réna Kriel** at **072 861 9191** if you have any further questions or have any problems.

You can contact the **Health Research Ethics Committee** at **021-938 9207** if you have any concerns or complaints that were not adequately addressed by the researcher.

You will get a copy of this information and consent form.

Declaration by Parent

By signing below, I agree that my child may take part in a research study entitled *Perspectives of Spinal Health in School-going Children and Adolescents in the Langeberg Municipal District of South Africa: a Qualitative Study*.

I declare that:

- I have read or had read to me this information and consent form and it is written in a language with which I am fluent and comfortable.
- I have had a chance to ask questions and all my questions have been adequately answered.
- I understand that taking part in this study is voluntary and I have not been pressurised to take let my child take part.
- The interview or discussion may be recorded.

Signed at (*place*) on (*date*)

.....

.....

Signature of parent

Signature of witness

Declaration by investigator

I (*name*) declare that:

- I explained the information in this document to
- I encouraged him/her to ask questions and took adequate time to answer them.
- I am satisfied that he/she adequately understands all aspects of the research, as discussed above.

Signed at (*place*) on (*date*)

.....

.....

Signature of investigator

Signature of witness

Appendix 8: Assent Form for Learner Participants



STELLENBOSCH UNIVERSITY

Division of Physiotherapy • Department of Health Sciences •
Faculty of Medicine and Health Sciences • P.O. Box 19063 • Tygerberg 7505



Title of the research project: Perspectives of Spinal Health in School-going Children and Adolescents in the Langeberg Municipal District of South Africa: a Qualitative Study

Researcher: Réna Kriel

Contact number: 072 861 9191

What is RESEARCH?

Research is something we do to find new knowledge about the way things (and people) work. We use research projects or studies to help us find out more about disease or illness. Research also helps us to find better ways of helping, or treating children who are sick or have problems.

What is this research project is all about

Through research we have learned that children are having more and more problems with their backs. We would like to know why children are having problems; what the problems are; and how can we fix the problems. We are doing our research in schools in the Langeberg District (Ashton, Bonnievale, McGregor, Montagu & Robertson areas).

We are doing interviews and group discussions with some teachers, parents and school children to get as much information as possible.

Why you have been invited to take part in this research project

You have been invited to participate because you are going to school in the Langeberg District.

Who is doing the research?

I am Réna Kriel. I'm studying at Stellenbosch University and am doing this research project for my degree.

What will happen to you during the study?

During the study you will be asked some questions about your back. You will participate in a group with some of your classmates and everyone will be asked the same questions. The talks will be recorded.

Can anything bad happen to me?

Nothing bad can happen to you during the study.

Can anything good happen to me?

We are going to use the information from this research to help children in the future. Nothing will happen to you during the study.

Will anyone know I am in the study?

Your parents and teachers will know that you are taking part in the study (so they know where you are, the talk will be during school time), but they will not know what you say during the group talk. No one else will know you took part in the study and your name will be kept secret from other people.



Who can I talk to about the study?

You can talk to Réna (**072 861 9191**) if you have any questions about the study,

Or

You can talk to one of my teachers from the University who is making sure I follow the rules for this research study (**021 938 9207**).

What if I do not want to do this?

You do not have to take part in the study; you may say no even if your parents said yes. You can also stop being in the study at any time even if you said yes. You won't get into any trouble if you do not take part. It is your choice to take part and you may say "no".



Name:

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 pull out of the study at any time?

 YES NO

Signature of Child

Date



Appendix 9: Transcript extracts

Extract 1:

I: okei, nou om te begin, wil ekke graag weet wat weet julle van ruggesondheid, hoe om jou rug op te pas? Wie gaan begin? Iemand moet begin

P: ons het maar net daai tyd by die fabriek nog gewys, dan nie, die korrekte manier hoe om goed op te tel, en daai. Dis maar wat ons by die fabriek geleer het. Daai jare by *fabriek. Hulle het altyd by die kursus vir ons gewys as jy iets wil optel en so ja

P: jy moet jou knieë buig

P: ja, maar dis omtrent al wat ons, wat ek weet van ruggesondheid

I: okei, so by die fabriek, by die kursus, knieë buig as jy iets wil optel. Enige iemand iets anders al?

P: ek het weer net gelees van hoe jy jou rug kan oppas, deur mooi te sit en as jy miskien iets swaar optel, jou rug hou jou mos styf

I: so reg te sit, wat is reg te sit? Om regop te sit? En almal sit skielik regop. Okei, en jy't dit gelees, waar het jy dit gelees?

P: ek het dit in 'n *tydskrif gelees, dis 'n ou *tydskrif wat ek net deur gegaan het

I: so dis lank terug?

P: nee, dis nou paar wekies terug

I: oh maar jy het op 'n ou *tydskrif afgekom waarin dit was

P: ja

P: by die skool word die kinders ook mos van die begin af geleer, voetjies by mekaar, en jou rug moet teen die stoel se rugleuning wees as jy gaan skryf, jy moenie lê nie. Want nou het die kind nou hulle eie gedagtes gemaak van wat kan nou gebeur, en so, of as jy nie reg gaan skryf nie, of jou rug gaan skeef raak. En by die huis leer jy ook maar die kind as hy gaan eet hy moet reg sit op die stoel, hy moenie lê nie. Om die regte posisie te kry

I: okei, ons het bietjie goed optel en dan hoe jy moet sit, en dan die kinders by die skool ook geleer word. Okei, bring daai kinders ooit daai inligting huis toe en sê "mammie jy sit nie reg nie, ek is by die skool geleer jy moet"

P: (koor van nee) jy kry 'n voorbarige kind wat dit kan doen, dan moet jy vir hom sê (gelag) wat gaan sê. Maar die ander, as jy nou sê "het juffrou nie vir jou geleer nie?" "nee, juffrou het nog nie vir my geleer nie" so jy kry mos daai tipe wat net doen

I: so daar is van hulle wat dan nou bietjie tee praat wat juffrou leer

P: een van die onderwysers van die intermediêre fase het nou die dag gesê dat die kinders, so paar jaar terug, dat hulle die sakke, beginne minder swaar maak het dat die kinders nie so sukkel met die

boeke nie, want hulle gooi dit mos altyd net oor die een skouer. Altyd net oor die een skouer vir die skewe manier

P: soms trek dit in die niere (mense in omgewing praat gewoonlik van “nier-pyn” wanneer hulle para-vertebrale lae rug pyn het) ook in want dit raak te swaar

I: want dis te swaar. Nou het julle al julle kinders se tasse gedra?

P koor: ja, dis swaar

P: veral my meisie kind wat in gr.6 is

P en hulle dra dit altyd oor een skouer in plaas van oor altwee skouers

P: veral as hulle haastig is ja, dit gooi hulle dit oor een kant

I: so as hulle haastig is dan gooi hulle hom oor een kant. En julle het nou al self gevoel julle kinders se tasse is swaar

P koor: baie swaar

I: veral die wat ouer kinders het?

P: ja, ek het al gevra of my kind nie net die dag se boeke wil saam vat nie, toe sê hy hy kan nie, hy moet alles saam vat.

P: moet alles saam vat ja (koor stem saam)

(oor mekaar praat onduidelik)

I: okei, so die kinders, wat ek nou hoor, die kinders se tasse is baie swaar en die kinders dra elke dag al hulle boeke, maar juffrou sê nou dat hoef eintlik nie, hulle moet net hulle boeke by die rooster pak. Okei, so daar is dan nou bietjie verantwoordelik by die kinders. Okei, nou as ons nou kyk, julle het geleer by die fabriek, jy het gelees, bietjie gehoor van die skool af hoe die kinders moet sit, enige plek anders waar julle enige iets tee gekom het oor hoe om jou rug op te pas?

P: ek het 'n baie, my rug is baie seer, en dan vra die dokter, “mevrou hoe buk jy” dan wys ek sommer nou, so. Ek het nou vanoggend ook, dan “nee mevrou jy moet nou regop staan en jou kniekies buig” maar as jy nou haastig is, jy wat 'n ma is, om nou ietsie hier onder uit die kas uit, ek het vanoggend weer bietjie gou regop gekom. Dis net, net soos dit dan is daai rug van jou seer

I: so dit is spesifiek by die dokter gewees, by die kliniek?

P: die dokter, toe ek by die dokter was, in Robertson

I: in Robertson, okei. Wie van julle hier loop kliniek? Met 'n kind of met enige, iemand? Okei, het julle al iets by die kliniek gesien oor hoe om jou rug op te pas?

P: plakkate, ja plakkate

I: is daar plakkate?

P: ja

I: het julle al gekyk daarna?

(gelag)

Extract 2:

I: nee, en as jy in 'n kar ry, jy hoef mos nie die bestuurder te wees nie?

P: jy raak somtyds, dan voel dit nie vir jou reg nie, want jy sit te lank. En dan begin jou rug of jou holle raak, dit raak styf, dan voel dit vir jou jy kan nie beweeg nie

P: bene trek

P: hulle sê mos jou spiere moet altyd in 'n beweging is en jy sit mos nou net die heelyd en dan trek jou spiere mos nou styf

I: okei, nou wat is lank? As julle praat van lank sit, wat is lank?

P: miskien meer as twee ure

P: lang afstand ry (beaam)

P: my pa ry 20 uur per dag. My pa stop seker net een keer by 'n Shell garage of so. Dan vra ek vir my pa hoe voel hy, dan sê my pa hy kan nie eers beweeg nie. Somtyds moet hy 'n draffie om die trok vang so, net om te ontspan

P: en as jy in die saal ook sit somtyds, dan gaan almal aan die beweeg want almal raak styf (beaam) van heelyd so sit

I: in die saal?

P: in die skoolsaal ja

P: en die manier wat mens sit kan ook veroorsaak. Want as jy lank miskien so sit (demonstreer vooroor lê) dan raak dit so branderig hier agter by jou rug

I: so as jy daai krom rug sit vir 'n lang tyd, dan brand jou rug? (beaam) okei, julle het nou spesifiek gepraat van in die saal, sit julle nie op stoele in die saal nie?

P: nee, daar is stoele maar ons sit nie op die stoele nie

P: ons sit op ons sakke

P: net die prefekte mag op die stoele sit. Jy moet op die grond sit of op jou rugsak

I: okei, en in watter posisie sit julle dan?

P: jy sit so, op jou sitvlak

I: kruisbene, bene onder jou ingevou (beaam) reguit bene?

P: reguit bene of kruis bene

I: so julle sit in verskillende posisies?

P: ja (beaam) daar's sekere kinders wat met hulle bene so straight sit of party lê sommer (beaam)

I: so dis nie dat julle moet regop sit of iets nie, jy sê nou hulle lê vorentoe op hulle arms? (beaam) sodat jy rus op jou arms met jou kop (beaam)

P: maar dan kom daar onderwysers en jy lê daar, dan moet jy altyd opstaan om reg te sit

P: maar dit bly so bietjie branderig hier

I: nou hoe lank sit julle in die saal?

P: seker so halfuur

I: okei, so ons het nou 'n lang tyd, twee ure in 'n kar, en dan binne 'n halfuur in die saal wat dit ook branderig is (beaam) so dit wissel van plek tot plek (beaam)

P: maar in die saal is daar nie soos 'n rugstut nie, soos in 'n motor nie. In 'n motor gaan jy nie regop sit nie, maar jy gaan nie te lêerig wees in 'n motor nie. Want hulle het dit reeds gemaak om jou rug te stut, dis hoekom hulle die spons insit, sodat jou rug, dit net gemaklik moet wees. In die saal word daar die heelyd krom gesit, so daar's niks wat jou rug (beskerm) ondersteun nie

I: so die rede hoekom jy in 'n motor dan nou langer kan sit is oor jy rug ondersteuning het, en in die saal het jy geen rug ondersteuning nie (beaam) so die rug word nie beskerm in die saal nie (beaam)

P: en, sorry tannie, as 'n mens stres ook dan kan 'n mens se rugbesering ook, jy stres nou gaan sit al die stres miskien op jou skouers. So 'n swaar sak agter, voel dit swaar dan kan dit in jou rug inwerk. Soos dit stres

I: so stres wat in jou skouers gaan sit en jy't nou gesê die swaar sak, dan voel dit erger (beaam)

P: soos as jy baie jou rugsak dra dan voel jy dit sit daar en dan brand dit so mens se rug

I: as jy rugsak dra dan brand jou rug?

P: nee tannie, dis mos nou swaar, dis mos nou baie swaar en jy dra die aanmekaar. Dis swaar, iets wat swaar is laat jou mos

I: hoe swaar is julle rugsakke dan?

P: baie swaar (beaam)

P: sekere kinders sin is baie swaar, en sekere kinders wat niks boeke saambring nie, hulle kom sit net hier by die skool

I: okei, so van die kinders het baie swaar tasse, is dit as gevolg van die boeke wat hulle saambring? (beaam) en dan ander dra glad nie hulle boeke saam nie, hulle kom net skooltoe? (beaam)

P: hulle bring een boek en dan skryf hulle al die werk in daai een boek

Extract 3:

P: van die skool se kant af dink ek is daar nie regtig meer wat 'n skool kan doen behalwe om dit die heelyd onder hulle aandag te bring nie. Deel van ruggesondheid is ook die regte sitposisie en dit word die heelyd in die klas, veral in 'n grondslagfase klas, word dit gereinforce deur te sê "sit mooi, hoe sit ons" ons leer jou voetjies is bymekaar. Uhm, jou ruggie is teen die rugleuning, jou boudjies is ingeskuif tot teenaan en daar's 'n seker afstand tussen jou en die tafel. Daar's 'n seker afstand tussen jou kop en die bladsy. So daai korrekte postuur word in die grondslagfase baie op aandag aan gegee en die heelyd op klem gelê. Ek dink hoe verder mens gaan, hoe meer gemaklik raak dit dalk. Dan lê die ouens op hulle kruis in die klas en hulle luister, ek dink, behalwe net nie in mnr * se klas nie, hy sal vir jou sê sit regop. So ek dink van 'n skool se kant af kan 'n mens deur die korrekte sitposisie heelyd, nie net in die grondslagfase nie, maar dwarsdeur die skoolloopbaan kan 'n mens dit beklemtoon

I: okei, ek gaan vir juffrou nou so vra, die banke wat die kinders hier gebruik, is dit die standaard ou, die bank wat vas is aan die tafeltjie?

P: die gr.3's sit op 'n bank, die dubbelbanke met die flappies wat opslaan, die gr.1's en 2's sit by tafeltjies en stoeltjies

I: tafel en stoele, en dis die kleiner stoeltjies wat spesifiek gemaak is vir hulle grootte?

P: ja, maar ons het 'n paar groot manne en ons verskaf dan groter tafels en groter stoele aan hulle want jy kan nie elke keer as jy wil opstaan aan die tafel vassit nie

I: so hierso word daar spesifiek gekyk na die kinders se grootte en dit word gecater dan vir hulle sodat hulle reg kan pas in hulle toerusting, hulle tafel en hulle stoel

P: ja

I: en dan sodra hulle groter is natuurlik dan gaan hulle na die skoolbanke toe. Is daar 'n korrelasie tussen die skool banke, ek meen dit is mos 'n redelike standaard grootte, en hoe die kinders dan sit, net oor hoe die skoolbanke is, want dit nie gewoonlik so gemaklik nie?

P: nee, ek dink nie so nie, ek dink nie, of elk geval nie by ons nie want ons is in hierdie klein dubbelbankies, so die kinders is relatief gemaklik daarin. Ek dink waar beserings dalk baie keer plaasvind is wanneer die ou vir die een langs hom 'n poets bak en hy sy klappie opslaan en dan val hy dwarsdeur. Dis maar soos wat ons almal maar een of ander tyd oorgekom het

I: ja, gedoen het, so dit is bietjie van 'n gevaar maar dit is nou maar wat kinders doen. Uhm, hulle het al probeer om die banke se flappies nie te laat opkom nie en dan sukkel ons meer om dalk in te kom,

P: ja

I: so dit is nou weer 'n ander ding. Uhm, as ons kyk na die hindernisse, is daar 'n manier wat ons nog van dit kan uitskakel? Juffrou hulle het dit nou al eintlik redelik baie gedoen in hierdie skool, maar om dit nou te vat en uit te brei, dit gaan nie iets wees wat ons plaaslik kan doen nie, dit gaan moet hoër gaan

P: ja, uhm, ek weet in die kurrikulum van die lewensoriëntering van gr.4 tot gr.7, is daar relatief, uhm, relatiewe inligting oor jou lyf gesond te hou. Uhm, of dit genoegsaam is, of dit genoegsame inligting spesifiek oor ruggesondheid is, weet ek nie rêrig nie, ek kan my nie uitspreek oor daai kurrikulum nie

I: so as daar 'n plek in die kurrikulum sou wees, sou dit gewees het in die LO kurrikulum om te gaan kyk, basies na kinders se algehele gesondheid en dan nou die LO meer gesondheids oriëntasie te maak

P: ja, postuur gedeelte by te kom, want ek dink ook, party kinders loop mos so, hulle loop soos sekels,

I: slouch, slouch houding

P: ja, so, dit is nie iets wat mens een keer 'n jaar doen nie, dit is nie iets wat mens een keer 'n week doen nie, bewusmaking is iets wat konstant deurlopend gedoen moet word. Want stap regop, mens stap nie so nie. Skouers terug, maag in, boudjies, borsie uit, boudjies in, dis hoe 'n mens stap. Dis, tot dat dit 'n gewoonte raak is dit iets wat konstant gesê moet word.

I: en die beste plek om dit in te boelie in kinders in is as hulle klein is om dit 'n gewoonte te maak

P: ja

I: uhm, dink juffrou, ek gaan nou bietjie meer na die, daai speel nou taamlik op die kinders se oudio, as ons kyk na visueel, as jy goeters wou opsit, dat hulle gedurig goed sien van hoe jy moet sit, hoe jy moet staan, hoe jy jou goed moet dra, sal daai visuele impak, herhaaldelike impak, 'n verskil maak?

P: uhm, as dit vir hulle verduidelik word, ja. Dit help nie jy sit 'n prentjie op nie, en hulle dink dis 'n prentjie van 'n geraamte mannetjie wat daar staan. Ons het dwarsdeur die skool het ons ons skool se waardes opgesit, en selfs dit roteer ons elke 5 weke sodat daar 'n ander prentjie op 'n ander plek sit, anders raak dit, mens sien dit nie meer raak nie

I: mens sien dit nie meer raak nie. So as mens so iets sou opsit, dan moet jy eers verduidelik, sodat hulle weet wat daar aangaan, en dan al hulle dit gedurig sien sal dit basies 'n impak maak, dis die herhaling, maar dan moet jy seker maak jyt 'n verskeidenheid en dat jy dit dan roteer anderste loop jy verby en dan sien jy dit nie meer nie

P: dan sien jy dit nie eers raak nie, ja. En kyk ons kinders is dan ook nou anders, as jy 'n plakkaat in 'n hoërskool opsit wat fyn skrif op het, dan is hulle in staat om dit te lees, ons kinders wil net prentjies kyk.

I: so laerskool definitief, alhoewel hoërskool kinders is ook nie lief vir lees nie, so dit moet prentjies wees hoofsaaklik

P: ja, dit moet verseker visueel aantreklik wees anders gaan hy nie die moeite doen om eers nader te staan en te kyk wat daar aangaan nie

Appendix 10: Adapted questions for children

Questions regarding Spinal Health in schools:

1. What do you know about spinal health / back care (taking care of your back)?
2. What type of spinal health education have you been exposed to? / What type of back care have you been taught?
3. What are your feelings towards spinal health of learners? / How do you feel about school children's back care?
4. What do you think the impact of spinal health is on an individual? / What difference do you think back care makes?
5. What do you think signs of poor spinal health are? / What do you think you'll see in children who don't look after their backs?
6. What do you feel are the facilitators and barriers to good spinal health? / What do you think helps and what prevent children from taking care of their backs?
7. What do you think can be done to facilitate with spinal health barriers? / What do you think we can do to lessen the things that prevent children from taking care of their backs?
8. What do you think are the most important aspects to be included in good spinal health promotion? / What do you think are the most important things we must add when we want to teach children how to take good care of their backs?

Appendix 11: Afrikaans Questions for IDI's and FGD's

Die term ruggesondheid is as "hoe om jou rug op te pas" aan alle deelnemers verduidelik.

1. Wat weet jy van ruggesondheid?
2. Watse tipe ruggesondheid onderrig is jy al aan blootgestel?
3. Wat is jou gevoelens oor die ruggesondheid van kinders?
4. Wat dink jy is die impak van ruggesondheid op 'n individu?
5. Wat dink jy is tekens van slegte ruggesondheid?
6. Wat voel jy is die fasiliteerders en hindernisse vir goeie ruggesondheid?
7. Wat dink jy kan gedoen word om te help met die hindernisse van ruggesondheid?
8. Wat dink jy is die belangrikste aspekte wat ingesluit moet word in ruggesondheid onderrig?

Appendix 12: Coding tree

Code Families	Main Themes	Sub-themes
Influencing factors	Facilitators	School bags
		Heavy loads
		Physical activity
		Sports
		Posture
		Teachers
	Barriers	Passivity
		Playing
		Sports
		Furniture
		School bags & suitcases
		School
		Knowledge
		Pregnancy
Posture		
Interventions	Proposed Interventions	Load reduction
		School bag types
		Physical activity
		Posture
		Knowledge & Awareness
	Health Promotion	Methods
		Mediums
Side-effects	Impact	Academic
		Physical abilities
		Social
		Recreational
	Outcomes	Signs
		Symptoms
		Behavioural changes
	Adverse Events	Serious
		Minor
Theory & accessibility	Knowledge	Spinal Protection
		Workings of the spine
		Pathologies of the spine
		Bad spinal habits
	Attitudes	Positive
		Negative
	Education Types	Medical Professional
		Personal Experience
		Relative
		Media
		Courses