

# THE PREVALENCE OF LOW BACK PAIN AMONG HIGH SCHOOL CHILDREN IN NYAMASHEKE DISTRICT/ RWANDA.

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## Abstract

**Background:** Low back pain among high school children is perceived to be uncommon in the clinic setting. However, previous studies have suggested that it may be an important and increasing problem to be managed in this age group.

**Objectives:** The overall aim of this study was to determine the prevalence of low back pain among high school children in Nyamasheke district in Rwanda.

**Study Design:** A cross-sectional descriptive survey was completed by a convenient sample of high school children.

**Results:** The mean age of the study sample was 17 years, and 48.2% were females compared to 51.8% of males. The response rate was 96.2%. The low back pain prevalence was found to be 66.1%. The mean age of the first occurrence of low back pain was 14.5(SD = 2.28). One year prevalence was found to be 25.4% whereas the one month prevalence was 13.7%. Males were the most to report low back pain comparatively to females with 53.1% and 43.9% respectively. High school children from the rural region were the most to report low back pain in comparison to those from urban region with 61.5% against 38.5% respectively.

**Conclusion:** The findings of this study are important for clinicians, researchers and policy makers. This information could be used by these health-care professionals to develop appropriate prevention and rehabilitation strategies for this specific group of patients.

**Key words:** low back pain, school, children, prevalence

## INTRODUCTION

Low back pain was traditionally reported to be uncommon in children. Moreover, it was believed that this symptom was almost always due to a serious underlying illness (Spence, Jensen & Shepard, 1984). During recent decades, particularly since the publication of the thesis of Salminen in 1984 (Salminen, 1984), there has been an increase in the number of surveys that has demonstrated that non-specific low back pain in school children is much more frequent than thought in the past (Kristjansdottir, 1996; Brattberg, 1994; Balague, Dutoit & Waldburger, 1988). Later, various surveys have been published reporting factors associated with, or predisposing to low back pain (Pelisse et al., 2009; Cardon & Balagué, 2004). The methodological quality of the studies has improved progressively over time moving from cross-sectional

studies, only allowing obtaining figures of prevalence and associated factors, to longitudinal studies reporting incidence and causal relationship (Cardon & Balagué, 2004). Furthermore, clinical and epidemiological data analysis of risk factors, Magnetic Resonance Imaging (MRI) and immunohistological findings draw attention to the early degenerative changes of the spine and to the usefulness of precocious prevention (Phelip, 1999; Salminen, Erkintalo, Pentti, Oksanen & Kormano, 1999). In addition, there is growing evidence that back pain at a young age has a predictive value on low back pain as an adult (Adams, Mannion & Dolan, 1999; Harreby, Neergaard, Hesselsoe & Kjer, 1995). Low back pain is the most prevalent musculoskeletal condition and one of the most common causes of disability in the developed nations (Pelisse et al., 2009). However, it has been found that low back pain

in children is different from low back pain in adults. Compared to an adult, a child with a backache is more likely to have serious underlying disorders (Balague et al., 1995). In addition, low back pain in children is a prevalent symptom with overall associated disability and impacting on health related quality of life. In a study conducted by Pelisse et al. (2009), low back pain in a group of children was associated with whole body pain and report of significant impairment which deserved much more attention.

Some existing research indicates that low back pain is a common complaint during childhood (Burton, Clarke, McClune & Tillotson, 1996). Furthermore, biannual nationwide surveys in Finland revealed that prevalence of low back pain in school children is on the increase (Vikat et al., 2000). It appears that most of these cases were mild in nature. They can be considered as a natural part of growing and represent little consequence to health (Salminen et al., 1999; Burton et al., 1996). In contrast, some children suffer from recurrent low back pain. These cases have a more chronic evolution, lead to greater disability and require increased medical attention (Harreby et al., 1999; Salminen, Pentti & Terho, 1992). The authors reported that further research needs to focus on evaluating prevalence and consequences of recurrent low back pain, since it is this group that is likely to suffer health consequences as a result of the low back pain. Moreover, recurrent low back pain during the adolescent years may be a precursor for chronic low back pain during adulthood (Salminen et al., 1999, Salminen, Erkinntalo, Laine & Pentti, 1995; Harreby et al., 1995).

In the United States of America (USA), the prevalence of low back pain in school children approaches that seen in adults due to heavy backpacks 37% (Balague, Dutoit & Waldgurger, 1998). Anecdotally, there is a general assumption that the prevalence of LBP in developing countries is comparatively lower than in developed countries (Gilgil et al., 2005; However, a systematic review conducted in Africa rejected that assumption (Louw, Morris & Grimmer, 2007). According to a study conducted in South Africa and in Nigeria among workers and school children, the mean LBP point prevalence among school adolescents was 12% and among adults was 32% (Louw et al., 2007). Up to now no research was conducted in Rwanda relating

to low back pain among high school children. Thus the aim of this study was to determine the prevalence of low back pain among high school children in Nyamasheke district in Rwanda.

## **METHODOLOGY**

### **Research design**

A cross-sectional descriptive study design was used in order to determine the prevalence of low back pain. The descriptive study design was appropriate for describing the relationship of a phenomenon at one point in time. It is also economical and manageable within a limited time framework (Polit, Beck & Hungler, as Cited in Kamau, 2005; Domholdt, 1993).

### **Research setting**

The study was conducted among high schools located in the Nyamasheke district which is one of the seven districts of the Western Province in Rwanda. The district is composed of 15 sectors and each sector is divided into six cells.

### **Population and Sampling**

According to a recent report from the department of Education in January 2011, Nyamasheke district has 24 high schools with an average number of 24 800 high school children. The study population consisted of all high school children registered in the Nyamasheke district high schools in Rwanda. In order to be included in the study, participants had to be willing to participate, aged between 13-21 years old and registered in one of the Nyamasheke schools. Simple random sampling was used to select ten high schools in which the study was conducted. Based on the location, four schools were selected from the nine urban schools and six schools were selected from the 15 rural schools. The ten high schools identified had 10 330 school learners. All high school children eligible to participate in the study were invited to participate. Using the Yamane's formula, the study was supposed to have a target of 400 high school children aged between 13 and 21 years old (40 from each selected high school). However, in order to have sufficient representation in each age category (13, 14, 15, 16, 17, 18, 19, 20 & 21 years old), the study targeted a sample of 1000 high school learners (100 from each selected school) which was selected by a stratified random sampling method (age).

### **Data collection tools**

The data among high school children was collected by means of a structured questionnaire which was aiming to determine the prevalence of low back pain among high school children. This questionnaire was designed based on the literature and expert advice and it was self-administered (Watson et al., 2002; Taimela et al., 1997). The questionnaire for the high school children consisted of two sections. Section one consisted of socio-demographic information such as age, gender, class, occurrence of low back pain and the period of studies in Nyamasheke district. The second section consisted of high school children's activities and institution characteristics including the predisposing factors for low back pain. Questions that were relevant to the objectives of the current study were included and questions from the source questionnaire that were not relevant to the objectives were excluded and open ended questions were changed into closed ended.

The face and content validity of the final questionnaire were tested by a panel of experts who work in the area of low back pain and work with children with low back pain. A pilot study was conducted within the study population to test the reliability of the questionnaire through a test and re-test. After reliability and validity had been established, the questionnaire was translated from English to Kinyarwanda by an independent translator. It was then translated back from Kinyarwanda to English by a different independent translator to test if it was the same as the original. The pilot study was conducted in one high school on 100 high school children (equal representatives from all stratified ages 13-21 years old). They were selected depending on the availability and willingness, and they were excluded from the main study.

The reliability of the questionnaire was assessed by using the test-retest method. This test consists of the application of the questionnaire to the same subjects, under a similar condition, in two or more situations (LoBiondo- Wood & Haber, 1998; Polit & Hungler, 1995). The time interval between the two measurements was taken as two weeks (Rubin & Rubin, 2004; Kuorinka et al., 1987). The test-retest reliability was analyzed using Statistical Package for the Social Sciences (SPSS) version 19. The Cronbach's alpha was used to test for reliability. In

the social sciences, a Cronbach's alpha of  $>0.70$  is acceptable and good at  $>0.80$  (Gliem & Gliem, 2003). The Cronbach's  $\alpha$  for the questionnaire was 0.848 and during the time period 2, retest of the reliability was Cronbach's  $\alpha$  0.849 which means the consistency of the questionnaire was good.

### **Procedure**

The initial procedure started by obtaining permission and ethical clearance from the UWC Research Grant and Leave Committee and UWC Higher Degrees Committee. Permission was then obtained from all concerned in Rwanda starting from the Ministry of Health through the Rwanda National Ethics Committee, the Ministry of Education and all concerned directors of high schools located in Nyamasheke district. After receiving the requested permission, three research assistants were recruited and trained by the principal researcher so that they could help in data collection. After the recruitment, the following data extraction strategies were used in order to avoid bias and increase inter- and intra-reliability. Firstly, the research assistants had enough training and practical sessions before starting data collection. During the training process, the researcher and the research assistants discussed the data elements as suggested by Banks (1998). The research assistants were advised at the beginning that their work will be checked for accuracy (Worster & Haines, 2004).

The study was verbally explained to all participants and an information sheet with further details about the study was also given to the participants. Participants were assured about the confidentiality and anonymity of information received from them and they were assured that they have the right to withdraw from the study any time without any negative effect. The investigator requested the administration of high schools to inform the learners' parents/guardians about the study on behalf of the investigator, in order to obtain informed parental consent. Informed written consent was obtained from all participants. The questionnaires were distributed and explained section by section to the willing participants. All participants were informed that they have a period of one week to complete the questionnaire. Before leaving, the researcher and the participants set up another appointment to meet at the same place for collection of questionnaires.

### Data analysis

The software SPSS version 19.0 for windows and the Microsoft Excel 2010 were used to analyze the data, where descriptive statistics were used to summarize the results. In addition, inferential statistics such as chi-square test were used to examine the significant relationships between predisposing factors and low back pain among high school children. Furthermore, analysis using Logistic regression and Wald were used to analyze the levels of the significant predictor variables. The results

were presented in the form of frequency distributions, percentages, mean and standard deviation by the use of tables and graphs.

### RESULTS

A total of 1000 questionnaires were distributed of which 962 were returned, yielding a response rate of 96.2%. The demographic data of the participants are presented in Table 1. The participants consisted of 498 males and 464 females with a mean age of 17 years (S.D = 2.4 years).

**Table 1 Demographic data of participants (n = 962)**

Variable	N	%
<b>Gender</b>		
Males	498	51.8
Females	464	48.2
<b>Age group</b>		
13-15	306	31.8
16-18	322	33.5
19-21	334	34.7
<b>Localization</b>		
Rural	581	60.4
Urban	381	39.6
<b>Education level</b>		
1st form	141	14.8
2nd form	135	14.0
3rd form	180	18.8
4th form	124	12.8
5th form	192	19.9
6th form	190	19.7

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### Frequencies of low back pain among high school children

Table 2 indicates levels and localization of pain including low back pain. Most of the participants (73%) reported that within the past month have had some aches or pain which lasted for one day or

longer. In addition, 66.1% reported that they have experienced low back pain. Within the past month, 99.8% (635/636) participants reported that they experienced LBP which lasted for one day or longer. Pain which spread down legs was reported by 21% and 12% usually take pain killers.

**Table 2 Levels and localization of pain**

Variables	No		Yes	
	N	%	N	%
Aches/pains over the past month (n = 962)	251	26.1	702	73
<b>Localization of pain (n = 962)</b>				
Low back pain (n=962)	326	33.9	636	66.1
Headaches (n = 962)	688	71.5	274	28.5
Pain somewhere else (n = 962)	608	63.2	354	36.8
Pain all over the body (n = 962)	855	88.9	87	9.0
LBP for one day or longer in the past month (n = 636)	1	0.2	635	98.8
Pain spread down to legs (n = 636)	502	78.9	134	21.1
Usually take painkillers (n = 627)	552	88.0	75	12.0

**Description of low back pain**

Table 3 highlights the pattern of the occurrence of LBP amongst the participants. Approximately 81% have suffered from LBP for more than 3 months. 33% are aware of their pain throughout the day. Of those with LBP, 25% reported a year prevalence and approximately 14% reported a one month

prevalence. The majority of the high school children (263/635 = 41.4%) who had LBP reported that the first onset started during the age group of 12-14 years old. The minimum age of the first occurrence of LBP was reported to be 9 years old and the maximum age was 19 years old giving the mean age of 14.5(SD = 2.28).

**Table 3 Description of low back pain (n=636)**

<b>Onset of pain (n = 615)</b>	<b>N</b>	<b>%</b>
Less than 3 months ago	115	18.7
More than 3 months ago	500	81.3
Missing	21	3.3
<b>Description of Low back pain (n = 635)</b>		
Aware of pain all through the day	210	33.1
Pain comes and goes through the day	272	42.8
Short spell of pain for few minutes	153	24.1
Missing	1	0.1
<b>Days of LBP over the past month (n = 636)</b>		
0 - 5 days	300	47.2
6 - 10 days	191	30.0
11 - 15 days	95	14.5
16 - 20 days	30	4.7
21 - 25 days	10	1.6
26 -31 days	10	1.6
<b>Duration of LBP when it occurs (n = 636)</b>		
< than 12 hours	152	23.9
12 – 24 hours	163	25.6
1 – 7 days	214	33.6
>Than 1 week	107	16.8
<b>Onset of the episode of LBP (n= 636)</b>		
< than 1 month ago	31	4.9
1 – 3 months	77	12.1
3 – 12 months	153	24.1
>1 year	375	59.0
<b>Age of the first occurrence of LBP (n = 635)</b>		
9 – 11 years old	37	5.8
12 – 14 years old	263	41.4
15 – 17 years old	247	38.9
18 – 19 years old	88	13.9
Missing	1	0.1
<b>One year prevalence (n=962)</b>	245	25.4
<b>One month prevalence (n=962)</b>	132	13.7

**Pain according to Visual Analogue Scale**

Table 4 indicates the pain reported according to VAS and the comparison between mild, moderate and

severe pain. Participants were asked to rate their pain on a scale of 0-10. Of the participants who had pain, 63.5% reported pain of more than 5.

**Table 4 Pain according to Visual Analogue Scale**

<b>Pain scale</b>	0	1	2	3	4	5	6	7	8	9	10	<b>Total</b>
<b>Frequency</b>	1	9	28	39	80	75	79	56	66	115	88	<b>636</b>
<b>Percent</b>	0.2	1.4	4.4	6.1	12.6	11.8	12.4	8.8	10.4	18.1	13.8	<b>100</b>

Participants experienced pain differently in relation to their categories including their gender, age, localization of the school and their level of education. Results indicate that there was no association between low back pain and gender ( $p=0.232$ ). However, males reported low back pain more than females with the percentage of 53.1% and 46.9% respectively. There was a significant relationship between age group and low back pain ( $p = 0.000$ ). High school children with advanced age group (19-21 years old) were the most to report low back pain with the percentage of 44.8% compared to 24.4% of the age group 13 – 15 years old and 30.8% of middle age.

In summary, the present study indicates that the prevalence of low back pain among high school children in Nyamasheke district was high (66.1%) and the majority of them reported that they had experienced severe pain. No association was found between low back pain and gender. However, males reported low back pain much more than females. Although, high school children with advanced age group (19-21 years old) were the most to report low back pain.

## **DISCUSSION**

Low back pain has been on the increase in developed countries over the past decades (Gilgil et al., 2005) but little is known in developing countries. Information from other studies on the epidemiology of low back pain is accumulating, but for the most part, studies are restricted to high-income countries. This therefore means little is known about the epidemiology of low back pain in the rest of the world (Gilgil et al., 2005; Walker, 2000). The lack of information on the prevalence of low back pain among children in developing countries is therefore a significant shortcoming (Gilgil et al., 2005; Walker, 2000), particularly as it is predicted that the greatest increases in low back pain prevalence in the next decade will be in developing nations (WHO Scientific Group on the Burden of Musculoskeletal Conditions of the Start of the New Millennium, 2003). The findings of the current study reported a high prevalence of low back pain among high school children. In addition, one year prevalence was 25.4% whereas one month prevalence was found to be 13.7%. Amongst those who reported low back pain 64% have experienced severe low back pain rated  $>5$  according to Visual Analogue Scale. These

findings are similar to studies conducted in developed countries such as the United States of America (USA) and Australia, where low back pain prevalence ranges from 26.4% to 79.2% (Deyo et al., 2006; Walker et al., 2004). This study however, contradicts the statement of Gilgil et al. (2005) and Omokhodion and Sanya (2003) who reported a general assumption that low back pain prevalence in Africa is lower than that reported in the developed nations. It is in fact supporting the prediction of WHO Scientific Group on the Burden of Musculoskeletal Conditions of the Start of the New Millennium (2003). Thus the findings of a systematic review by Louw et al. (2007) which indicated that the low back pain prevalence among the African population was between 14% and 72 % should be taken into consideration. In the same line, still in Africa, a prevalence of 50% one year low back pain for adults was reported and 33% for adolescents (Naude, Mudzi, Mamabolo & Becker, 2009). Across the developed countries, 60-80% low back pain prevalence was reported among the general population of Switzerland (Naude et al., 2009). Most of the findings in all the studies mentioned above are in agreement with the results of the current study, although there are some minor differences. These differences could be explained by the inherent differences in the study settings.

In conclusion, low back pain has been indicated to be the most prevalent problem across different countries in both the developed and developing world. Although, the results of the present study on low back pain among high school children are slightly high, they are however in line with other studies conducted in both developed and developing countries. Since, prevalence of low back pain among high school children in Africa has not been widely explored a comparison with results of the few available studies show that a prevalence of 66% is high. In addition, it can be concluded that back pain should be seen as an issue for all ages and all sectors of society in all countries. The results of the current study will therefore contribute to the scanty information available in Africa.

## **Conclusion**

The findings of this study are important for clinicians, researchers and policy makers. Clinically, this study provides medical doctors, physiotherapists and other health professionals with information about

demographic status, prevalence, and need for health promotion as low back pain preventive measures. This information could be used by these health-care professionals to develop appropriate prevention and rehabilitation strategies for this specific group of patients, not only during the hospital admission, but also after discharge and before admission through the outreach programmes. Such a study in Nyamasheke district provides reliable data for referencing, especially by researchers and policy makers. Subsequently, it is a contribution to the knowledge about low back pain in Rwanda.

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