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Factors Contributing to Back Pain among Nurses in a Maternity Ward at a Level 5 Hospital, Kenya

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Abstract **Background:** Back pain is currently a global public health problem affecting many nurses in most departments in the hospital set up. Maternity wards are one of the busiest departments hence the reason for the researchers conducting the study among nurses in this department and in a Level 5 hospital in a developing country. **Purpose:** To determine factors contributing to back pain among nurses in the maternity department, in a Level 5 Hospital. **Objectives:** The study was based on four objectives, which included: to determine the socio-demographic factors of the nurses, prevalence of back pain among nurses, Body Mass Index (BMI) of the nurses, Perception of the existence of enough patient lifting equipment by nurses, the working hours of the nurses and Strategies that can be adopted to prevent back pain. **Methods:** A descriptive cross-sectional research design was used where nurses working in the maternity ward were targeted. A total of 20 respondents were surveyed. A self-administered questionnaire was used to collect data. Convenience sampling was used in selecting the participants. Only respondents who had given informed consent were issued with the questionnaire to fill at their convenience. Data was analyzed using Statistical Package for Social Sciences (SPSS) version 23.0. Descriptive data was presented in the form of bar graphs, frequency tables, and pie charts. **Results:** Eighty-five percent (85%) of the nurses reported to have experienced back pain. Both male and female nurses experienced back pain. A majority (88.2%) of the respondents had experienced acute back pain while the rest had experienced chronic back pain. The back pain was first experienced in the 1-5years of their professional experience. A majority (55%) worked for more than 48 hours a week and 95% reported that there was no enough heavy weight lifting equipment in the hospital. The respondents (60%) also reported that there were standard operating procedures and policies on heavy weight lifting in the hospital. **Conclusion and Recommendations:** Nearly all the nurses in the maternity ward reported suffering back pain. It is therefore recommended that policies and standards be formulated that will guide the nurse-working environment. Emphasis on good working postures, provision of heavy weight lifting equipment, and sensitization of nurses on the pathophysiology of back pain are other recommended measures to lower maternity nurses back pain.

Keywords Back pain, Nurses, Body Mass Index, Factors

1. Introduction

Globally back pain has been found to affect the quality of peoples' health hence affecting work output. In the global burden of disease low back pain has been declared one of the top causes of disability [1]. In a study conducted in the United States (US) health care workers and several occupation groups were found to have an increased risk of low back pain [2]. In a study in Canada the point prevalence and incidence of low back pain among orthopaedic nurses was 30%, 60%, and 25%, 58% in intensive care nurses respectively. The researchers also noted that there was need for ergonomic interventions aimed at reduction of low back pain among nurses in the country [3].

In a study conducted in Iran, the prevalence of low back pain among nurses was 72% and there was a significant relationship between awkward trunk postures and low back pain [4]. In another study in an Iranian hospital, the prevalence of acute low back pain was 46% and chronic low back pain 29% over a one year period. The mean age of nurses suffering acute low back pain and chronic low back pain was 30.37± 4.10 and 34.78 ± 2.04 years respectively. There was no association between acute or chronic low back pain and night shift nor the type of ward [5]. In Nepal 78% of nurses were found to suffer low back pain which rendered 44% incapable of performing their job properly, 33% less productive, 28% restriction in performing their job

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and 26% not able to provide quality care to patients. It was further noted that heavy physical workload (51%), prolonged standing (82%) and frequent bending and lifting (51%) were associated with low back pain [6].

In a systematic review and meta-analysis on prevalence of low back pain in Africa, the annual, point and pooled lifetime prevalence of Low back pain in Africa was 57% (95% CI 51; 63), 39% (95% CI 30; 47), and 47% (95% CI 37;58) respectively. These figures are indeed higher or comparable to those globally [7]. In a systematic review of studies in Africa during the years 2000 to 2018 among nurses working in the clinical setup, the lowest prevalence of low back pain was 44.1% and the highest 82.7%. The highest prevalence was reported from studies in Nigeria. The West African region had the highest prevalence rate of 68.4% followed by the North Africa region at 67.95% and the South African region at 59% [8].

Majority of nurses in the Eastern Cape of South Africa were found to be experiencing low back pain on a regular basis. No proactive measures were found to be in place to deal with the affliction hence the researchers recommended establishment of policy guidelines [9]. Similarly the point prevalence of low back pain among nurses at a regional hospital in KwaZulu-Natal, South Africa was 59%. The highest prevalence was recorded among obstetrics and gynaecology nurses (49%), enrolled nurses (54%), overweight nurses (58%) and nurses between the ages of 30-39 years (46%) [10].

In a national hospital at Mulago, Uganda the commonest musculoskeletal disorder was low back pain (58.7%) which was related to work related factors and psychosocial stress [11].

In 2015, Tanui conducted a study in private and public hospitals in Mombasa County on work related musculoskeletal disorders (WRMSDs) among nurses and one of the conclusions was that back pain contributed to 76.9% of WRMSDs. Nurses were also found not to have adequate training on injury prevention, how to lift or move heavy objects in the hospital and working in the same position for long [12]. Mugga in 2013 conducted a study at Kenyatta National hospital on musculoskeletal disorders amongst nurses, and the prevalence of musculoskeletal disorders was found to be 74.2%. Lifting of heavy objects, poor posture and use of excessive force were the most obvious work related issues that predisposed the nurses to musculoskeletal disorders [13].

Thika Level 5 Hospital provides maternal services to an average of 20,000 mothers annually. The hospital's provision of quality maternal services has blurred inter-county boundaries, which has seen mothers trickle in from other Counties including Nairobi, Murang'a, Kirinyaga and Kitui, translating to a catchment population of about a hundred thousand people on average. Due to few nurses, this means that nurses in the hospital have more workload that may lead to increase in the potential for low back pain.

2. Methods

A descriptive quantitative cross-sectional study was conducted in the months of August and September 2017 in the maternity ward at Thika Level 5 Hospital. Since the population was small, the researchers undertook a census sample where the 31 nurses in the ward were sampled. Twenty (20) nurses gave informed consent and were sampled. Approval to conduct the study was sort from Mount Kenya University Ethics and Research Committee, and from Thika Level 5 hospital.

A self administered questionnaire was used to collect data from the nurses. The questionnaire was pretested at the then Gatundu Level 4 Hospital. Completed questionnaires were cleaned, coded and entered into the Statistical Package for Social Sciences (SPSS) version 23.0 for analysis.

3. Results

3.1. Respondents' Socio Demographic Factors

A total of 20 nurses in the maternity ward were issued with questionnaires. Three (3) male and 17 female nurses were surveyed. Fifty percent (50%) had attained a bachelor's degree in Nursing, 45% diploma in Nursing and 5% Master of Science in Nursing. The oldest respondent was 48 years old while the youngest was 28 years old. The mean age of the respondents was 35.7 years old hence the majority of the respondents were in the prime of their professional career. The majority of the respondents (90%) had more than 5 years of experience in the maternity ward while 10% had less than 5 years of experience. The majority of the respondents thus had worked in the maternity wards for a long period.

Table 1. Socio demographic factors of the nurses (n=20)

	Socio demographic Factors	Number (n)	Percentage (%)
Gender	Male	3	15
	Female	17	85
Education	Diploma	9	45
	Bachelors	10	50
	Masters	1	5
Professional experience	1-5 years	2	10
	>5 years	18	90
Age	28-34	9	45
	35-40	8	40
	41-48	3	15

3.2. Prevalence of Back Pain among Nurses

From the question on whether the respondent had experienced any back pain in their careers, 85% of the respondents agreed to have experienced back pain, which comprised of 66.7% of male and 88.2% of female respondents. This therefore points to the fact that back pain affects both the male and female nurses (Table 2). These

finding concur with those of Attar (2014) who identified that back pain is a significant problem for nurses.

Of those respondents who had back pain, 88.2% reported to have experienced acute pain while 11.8% reported chronic pain. The majority (88.2%) of those who had back pain reported that the pain started in the 1-5years of their professional experience while 11.8% said that the back pain started after more than five years in their professional experience. From these findings the nurses in the maternity ward are likely to be more susceptible to back pain in their first 5 years of work experience.

Table 2. Back Pain prevalence among the respondents

Back pain prevalence		Frequency (n)	Percentage (%)
Experience back pain	Yes	17	85
	No	3	15
Male	Yes	2	66.70
	No	1	33.3
Female	Yes	15	88.20
	No	2	11.8
Type of back pain	Acute pain	15	88.20
	Chronic pain	2	11.8
Year when pain started	1-5 years	15	88.2
	>5 years	2	11.8

3.3. Body Mass Index of the Nurses

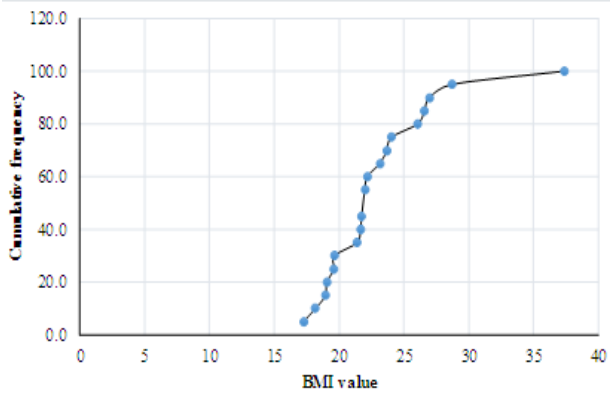

Figure 1. The BMI values of the respondents

The height of the respondents ranged between 130 cm to 185 cm with the mean height being 163.9 cm. On assessment of weight the respondents were found to weigh between 50 and 84 kg. The mean weight of the respondents was 62.25 kg. From the research, BMI of the respondents was between 17.24 Kg/M^2 and 37.33Kg/M^2 with the mean BMI being 22.99 Kg/M^2 (Figure 1). According to WHO Expert (2004), BMI classes include underweight (<18·49Kg/M^2), normal weight range (18·5–24·9Kg/M^2), overweight range (25–29·9 kg/m^2) and obese range (30 kg/m^2 and above). Ten percent (10%) of the respondents had a BMI of less than 18.5, 65% had a BMI between 18.5 and 24.9, 20% had a BMI between 25 and 29.9 while 5% had a BMI greater than of 30. Therefore majority of the respondents were within normal weight range, a good percentage overweight, one was obese and 10% underweight. In many studies BMI has been considered an important contributing factor to back pain.

3.4. Perception of Existence of Enough Patient Lifting Equipment by Nurses

Patient lifting in the hospital has been linked to back pain among medical practitioners. Availability of enough heavy weight lifting equipment is thus crucial in hospital setting. Seventy percent (70%) of the respondents in this study perceived that there was no enough heavy lifting equipment while 30% perceived there was (Figure 2). Of those who perceived there was no enough heavy weight lifting equipment 66.6% indicated that they did manual lifting.

The lack of enough patient lifting material in the hospital thus predisposes nurses in the maternity ward to heavy lifting which in turn increases their risk of back pain.

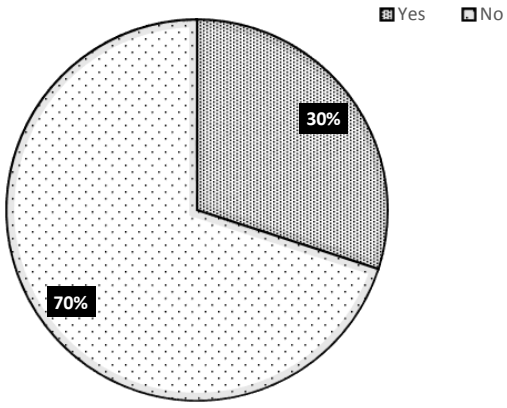

Figure 2. The perception of existence of enough patient lifting equipment (n=20)

3.5. Working Hours of the Nurses in the Maternity Department

The analysis of the working schedule of the nurses in the maternity ward identified that more than half of the respondents work for more than 48 hours per week (Figure 3).

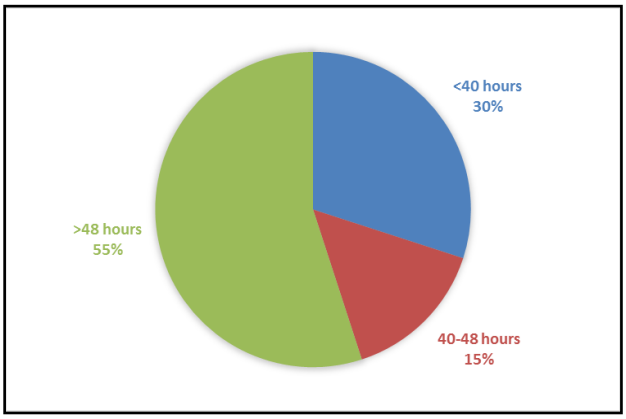

Figure 3. The weekly working hours of the nurses

3.6. Strategies that can be Adopted to Prevent Back Pain

Most (60%) of the respondents identified the existence of policies or standard operating procedures in the hospital for heavy weight lifting.

The researchers also evaluated some critical practices by nurses that aim to lower the chances of having work related back pain. When asked whether one maintains a wide, stable base with feet while handling patients 95% of the respondents said yes while 5% said no. When asked about the issue of raising the bed to the correct height that is waist level when providing care and hip level when moving a patient, 75% of the respondents said yes while 25% said no. All the respondents, however, agreed that they put the load or anything they are lifting directly in front of them to prevent rotating their spine. This is important as it protects injury or straining of the spine, which is the main cause of back pain. With the findings it can be concluded that majority of the nurses followed the standard rules for attending to the patient and avoiding working in a position that may affect their back.

Table 3. Strategies that can be adopted to prevent back pain

Strategy	Frequency (n=20)	Percent (%)
Are policies or standard operating procedures available in the hospital?		
Yes	12	60%
No	8	40%
Whether one maintained a wide, stable base with feet while handling patients		
Yes	19	95
No	1	5
Do you raise the bed to the correct height i.e. waist level when providing care and to hip level when moving a patient?		
Yes	15	75
No	5	25
Do you put the load or anything you are lifting directly in front of you to prevent rotating your spine?		
Yes	20	100
No	0	0

4. Discussion

Majority of the respondents in this study were in the prime of their professional career, 90% had more than 5 years of experience in the maternity ward while 10% had less than 5 years of experience. In several studies, age, gender and years that a nurse has worked in the hospital have been associated with prevalence of back pain. Awosan et al conducted a study in Sokoto, Nigeria and from the findings concluded that prevalence of back pain among the nurses was associated with older age, female gender and being in practice for more than 10 years [14]. In a Meta-analysis conducted by Azizpour et al. in 2016, low back pain was found to be 66% prevalent among nurses aged more than 45 years and 54.5% in nurses less than 45 years. Similarly it was determined that nurses with a working experience of 21-30 years had a 60% prevalence of low back pain and 1-10 years 53% respectively [15]. In a study conducted at Kenyatta National Hospital (KNH), where back pain was considered one of the musculoskeletal disorders, nurses between the ages of 35-44 years were the most vulnerable to musculoskeletal disorders [13].

Back pain was found to affect both the male and female nurses although the prevalence in gender differed slightly. Majority of the respondents reported to have experienced acute back pain while minority reported chronic back pain. These findings defer with those of a study conducted in China where most of the nurses reported to be experiencing moderate to chronic pain of the back and lower limbs. Back pain can indeed be debilitating [16]. Ovayolu1 et al. findings conducted in an intensive care unit in Turkey also defer as 66.7% of the nurses reported low back pain of moderate severity [17]. The findings of a study conducted on female Bangladeshi nurses however are consistent with the findings of this study as 72.9% of the nurses reported to have experienced low back pain lasting for at least one day, 31.8% chronic low back pain and 24.4% intense low back pain [18]. Nurses in the maternity ward in this study were found to be more susceptible to back pain in their first 5 years of work experience. Contrary to this are results of a systematic review and meta-analysis of Iranian nurses which show prevalence of low back pain to be more in nurses over 45 years with high work experience [15]. Consistent with this are findings of a study conducted in Zimbabwe where low back pain was the most common work related musculoskeletal disorder and the first episodes of work related musculoskeletal disorders were experienced by nurses in the first 5 years of working [19].

Majority of the respondents were within normal weight range, a good percentage overweight, one was obese and 10% underweight. Obesity has been associated with low back pain or musculoskeletal disorders in health care workers. In a systematic study conducted by Azizpour et al a BMI of >30 percentile (obesity) among other factors was found to be significantly associated with low back pain [15]. Contrary to these findings Mugga found out that there was no significant relationship between weight and musculoskeletal disorders among nurses working at a tertiary hospital in Kenya [13].

Majority (70%) of the respondents in this study perceived that the heavy lifting equipment in the hospital was not sufficient while 30% perceived it was. Of those who perceived there was no enough heavy weight lifting equipment, 66.6% indicated that they did manual lifting. Lack of enough patient lifting material in the hospital thus predisposes nurses in the maternity ward to heavy lifting which in turn can increase their risk of back pain. Sikiru and Shmaila from a survey conducted in specialized hospitals in Nigeria and Ethiopia concluded that lack of lifting equipment was one of the major predisposing factors of low

back pain among nurses [20].

Analysis of the working schedule of the nurses in the maternity ward led to the inference that more than half of the respondents work for more than 48 hours per week. Similarly Shieh et al concluded that longer working hours were a contributing factor of low back pain among nurses [21].

Most (60%) of the respondents identified the existence of policies or standard operating procedures in the hospital for heavy weight lifting. The researchers also evaluated some critical practices by nurses that aim to lower the chances of having work related back pain. June and Cho, identified the use of effective policies and standards in the nurses' working environment to be crucial in lowering nurses risks to back pain [22].

The respondents (95%) in this study reported that they maintained a wide, stable base with feet while handling patients. A good number (75%) also reported that they raise the bed to the correct height, which is waist level when providing care and hip level when moving a patient. All the respondents, however, agreed that they put the load or anything they are lifting directly in front of them to prevent rotating their spine. This is important as it protects injury or straining the spine, which is the main cause of back pain. It is important that nurses have good ergonomics as poor posture while working has been associated with back pain. Findings of a study by Chiwaridzo et al show ergonomics as one of the factors related to musculoskeletal disorders [19]. Similarly Burdorf et al, found out that completely eliminating manual lifting of patients reduced low back pain among nurses by 31.4% [23].

5. Conclusions

Majority of the nurses in the maternity ward reported suffering back pain and it was noted that equipment for heavy weight lifting were not readily available in the hospital. It is therefore recommended that policies and standards be formulated that will guide the nurse-working environment. Although most of the nurses employed proper ergonomics when handling patients, emphasis on good working postures, provision of heavy weight lifting equipment and sensitization of nurses are other recommended measures to lower prevalence of back pain among the nurses in the maternity ward.

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