A STUDY TO ASSESS THE PREVALENCE AND RISK FACTORS OF LOW BACK PAIN AMONG NURSES IN SIKKIM

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Abstract

Introduction: Pain is an unpleasant emotional state felt in the mind but identifiable as arising in a part of the body. Low back pain is a musculoskeletal disorder affecting the lower back. Nurses are known to be a high risk group for occupational low back pain.

Methodology: The study was conducted with the aim to assess the prevalence and risk factors of low back pain among nurses working in Sikim. Total 120 samples were selected proportionately by lottery method, STNM Hospital, Gangtok and Central Referral Hospital at Tadong, Sikkim. The prevalence and risk factors of low back pain was assessed by using self-structured questionnaire and anthropometric measurements. The findings of the study showed that; the current prevalence of low back pain was 34.17%. The prevalence of acute low back pain among the staff nurses was 41.67% and the prevalence of chronic low back pain was 48.33%. There were significant associations between low back pain and demographic variables age and work experience. Occupational risk factors, nursing large number of patients [OR = 4.65; CI (95%) was 1.39 – 15.62] and carrying or moving heavy materials and equipment [OR = 11.23; CI (95%) was 1.34 – 94.49] were statistically significant.

Conclusion: The present study concluded that the current prevalence of low back pain was 34.17% among the nurses of Sikim and occupational risk factors: nursing large number of patients and carrying or moving heavy materials and equipment were statistically significant. Thus the study revealed that the nurses need to modify their work practices and ensure that they use correct bending and lifting techniques.

Key Words: Low back pain, demographic variables, prevalence and risk factors, staff nurses.

Introduction

Pain is an unpleasant emotional state felt in the mind but identifiable as arising in a part of the body. Pain is a defence mechanism designed to make subject protect an injured part from further damage.¹

Low back pain is one of the most common work related health problems among hospital workers when compared to other groups. The incidence varies among different countries. Work related activities such as twisting, bending, sustained posture; repeated movements are
regarded as causal risk factors for low back pain and other back injuries. Low back pain has been described as one of the main occupational problems among health care workers and nurses.\(^2\) Feng CK. et al. also revealed that low back pain has been reported most frequently amongst nurses, nursing aides and other direct care givers.\(^3\) Nurses frequently have to lift or transfer patients who may move suddenly and carry out repetitive procedures with incorrect or poor body posture, which subsequently cause low back pain.\(^4\)

A study conducted by Anap Deepak B. et al. (2013) among rural hospital nurses in rural Maharashtra, India. The study investigated prevalence of Work related musculoskeletal disorders, job risk factors and the coping strategies towards reducing the risk of development of work related musculoskeletal disorders. Their study concluded that high prevalence of low back pain (89.1\%), certain risk factors like working in same position for long time, bending, twisting, lifting and treating excessive number of patients were strongly associated with work related musculoskeletal disorders.\(^5\)

Nurses are known to be a high risk group for occupational low back pain. The physical and technical difficulties involved in the work of nursing staff often lead to the occurrence of the problems. About 60 – 80\% of the world population experience pain at some time in their lives. In Western countries, back pain is the most common cause of sickness related absence from work. In the UK, 7\% of the adult population consult their general physician each year with back pain, at a cost of £500 million and 80 million working days lost. Only a small number of patients with back pain have pathologically definable problem.\(^6\)

DajahSalameh Al and DaghdiAbdalhamed Al. (2013) carried out a cross sectional study to determine the prevalence and risks of low back pain among nurses in Sudayr Region, Riyadh, Saudi Arabia. The tool used was a self-administered questionnaire and a visual analogue scale. The study sample was 250 nurses in different departments in four major hospitals at Suydar region, Riyadh, Saudi Arabia. The findings of the study were prevalence of work related low back pain was 53.2\%. Visual analogue scale for measuring the intensity of pain was 38.4\% and concluded that the work related prevalence rates of low back pain among nurses at Sudyar region was high and affected their daily activities, necessitating changes in work setting and observing their body ergonomics with recommendation of back school education.\(^7\)
A study conducted by Ajibade B.L. (2013) to assess prevalence of musculoskeletal disorders among nurses in two teaching hospitals Osun state Nigeria. The study was a descriptive survey design, and a self-structured questionnaire was used to collect the information from 138 samples. The results of the study showed that there was a high prevalence rate of lower back musculoskeletal disorders in nurses (70.3%), working hours (45.7%), and was more prevalent within the age group of 26 – 31 years and made the conclusion that more nurses were to be allowed to run a shift so that they could assist each other.

From the above review it is clear that studies to show the work related musculoskeletal health problems among health professional are very minimal in the developing countries, similarly incidence and information regarding the condition in the Indian context is minimal. Studies need to be done to assess the prevalence and risk factors among nurses and contributing factors of work related low back pain in the context of Indian situation. To the best of my knowledge there is a paucity of study conducted on low back pain and relationship between these factors among nurses in Sikkim. The aim of this study was to assess the prevalence and risk factors of low back pain among nurses employed in Sikkim.

**Problem Statement**

“A study to assess the prevalence and risk factors of low back pain among nurses working in STNM Hospital, Gangtok and Central Referral Hospital at Tadong, Sikkim”.

**Objectives**

1. To assess the prevalence of low back pain among the nurses.
2. To assess the association between prevalence of low back pain and demographic variables such as; BMI, work experience and Professional qualification.
3. To assess the relationship between prevalence of low back pain and risk factors.

**Hypotheses**

H₁: There is significant association between the prevalence of low back pain and demographic variables: BMI, work experience and Professional qualification

H₂: There is significant relationship between prevalence of low back pain and risk factors.
Methodology

The present study aims to assess the prevalence of low back pain and relationship of development of low back pain with demographic variables and risk factors. A descriptive correlational survey design was used for the present study. In the present study proportionate simple random sampling technique was followed. The total population of the staff nurses was obtained from each hospital and out of that 40% of the samples from each hospital were chosen for the study by lottery method. From STNM hospital out of 100 staff nurses only 40 samples were included for the study and from Central Referral Hospital, Tadong out of 198 nurses 80 samples were included for the study. Nurses who were suffering from pathological low back pain (Nurses with lower back pain as result of an accident, a deformity, or previous spinal injury; pathological backache due to infection) are excluded. Total 120 samples were selected for the study.

Data Collection instrument: The data was collected with the help of the tool developed in 3 Sections for the purpose of the study I: Demographic Performa, II: Prevalence of low back pain, III: Risk factors. Occupational and anthropometric measurements of the samples were taken. The constructed tool was given to experts for content validity. To ensure the reliability of the tool, it was administered to 20 subjects and its reliability was computed using split half KR 20 method for prevalence of low back pain which shows the reliability of 0.81 which is reliable and the tool could be used for the study. The reliability of risk factors of low back pain was 0.751 which indicated that the tool was reliable.

Data Collection procedure: After obtaining the formal administrative permission from the Medical Superintendent of the hospital, the data collection was conducted at Sir ThutobNamgyal Memorial Hospital (STNM), Gangtok, East Sikkim. After obtaining consent from the participants, data were collected by distributing the self-structured questionnaire to assess the prevalence and risk factors of low back pain and height and weight measurements were taken simultaneously. Total time was taken 40-45 minutes to fill up the questionnaires and to record measurements of height and weight from each subject.

Result and Analysis:

Description of sample characteristics
The questionnaire was distributed among 120 staff nurses and the anthropometric measurements were taken. The majority of the samples 70 (58.33%) belonged to age group of 21 – 30 years. 64 (53.33%) of the nurses were unmarried. The BMI of majority of the staff nurses 85 (70.83%) were normal (BMI = 18.5 – 24.9 kg/m²). Most of the subjects 52 (43.33%) work in other ward, maximum of the staff nurses 41 (34.17%) had 1 – 5 years of work experience. Majority of the samples 64 (53.33%), their professional qualification were GNM.

Table 1: Distribution of staff nurses according to prevalence of low back pain

<table>
<thead>
<tr>
<th>Prevalence of low back pain</th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Number (No.)</td>
<td>Percentage (%)</td>
</tr>
<tr>
<td>Suffering Current LBP</td>
<td>41</td>
<td>34.17</td>
</tr>
<tr>
<td>Suffered LBP in past 3</td>
<td>50</td>
<td>41.67</td>
</tr>
<tr>
<td>Months</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Suffered LBP past 12</td>
<td>58</td>
<td>48.33</td>
</tr>
<tr>
<td>Month</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table result of the study revealed that out of 120 staff nurses, 41 nurses were suffering from low back pain on the day of survey, which means that the current prevalence of low back pain was 34.17%. The prevalence of acute low back pain in the past three months among the staff nurses was 41.67% (50). During the last 12 months 58 nurses out of 120n staff nurses suffered from low back pain. Hence the prevalence of chronic low back pain was 48.33%.

Table 2: Association between low back pain and demographic variables

<table>
<thead>
<tr>
<th>Variable</th>
<th>Yes</th>
<th>No</th>
<th>Total</th>
<th>Chi Sq</th>
<th>df</th>
<th>P Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Suffered LBP in Last 3 Months</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Age (Yrs)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>21-30 years</td>
<td>36</td>
<td>34</td>
<td>70</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>31-40 years</td>
<td>11</td>
<td>25</td>
<td>36</td>
<td>6.932</td>
<td>2</td>
<td>0.031</td>
</tr>
</tbody>
</table>

www.turkjphysiotherrehabil.org
It can be inferred that there is significant association between low back pain with age & work experience of the nurses at p value 0.031 and 0.016. The study findings revealed that 41.67% of respondents were between the ages of 21 to 50 years was suffering from low back pain. There was no statistically significant association between low back pain and BMI of the nurses. The hypothesis $H_1$-- that there is significant association between low back pain and demographic variables for age and work experience was accepted for BMI could not be accepted.

Table 3: Shows relationship between low back pain and physical risk factors

<table>
<thead>
<tr>
<th>Physical Risk Factor</th>
<th>Odd of outcome</th>
<th>OR</th>
<th>95% CI</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Lower</td>
<td>Upper</td>
</tr>
<tr>
<td>Exercise</td>
<td>Yes</td>
<td>0.53</td>
<td>0.58</td>
</tr>
<tr>
<td></td>
<td>No</td>
<td>0.91</td>
<td></td>
</tr>
<tr>
<td>Pregnancy</td>
<td>Yes</td>
<td>0.80</td>
<td>1.52</td>
</tr>
</tbody>
</table>
It appeared that the risk of developing low back pain for nurses not doing exercise, those who had been pregnant, exposure to spinal anaesthesia, affected activities of daily living had odd ratio is 0.58, 1.52, 2.10 and 1.51 respectively. The 95% Confidence Interval of odd ratio of low back pain for physical risk factors includes 1 indicating insignificant OR and consequently insignificant relationship.

Table 4: Relationship between low back pain and occupational risk factors

<table>
<thead>
<tr>
<th>Occupational Risk Factors</th>
<th>Odd of outcome</th>
<th>OR</th>
<th>95% CI Lower</th>
<th>95% CI Upper</th>
</tr>
</thead>
<tbody>
<tr>
<td>Working in standing position for long periods</td>
<td>Yes</td>
<td>0.84</td>
<td>1.30</td>
<td>0.62</td>
</tr>
<tr>
<td></td>
<td>No</td>
<td>0.64</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Nursing large number of patients</td>
<td>Yes</td>
<td>2.75</td>
<td>4.65 *</td>
<td>1.39</td>
</tr>
<tr>
<td></td>
<td>No</td>
<td>0.59</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bending or twisting</td>
<td>Yes</td>
<td>0.95</td>
<td>1.51</td>
<td>0.69</td>
</tr>
<tr>
<td></td>
<td>No</td>
<td>0.63</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lifting or transferring</td>
<td>Yes</td>
<td>0.84</td>
<td>1.36</td>
<td>0.66</td>
</tr>
<tr>
<td></td>
<td>No</td>
<td>0.62</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Carrying or moving heavy materials and equipment</td>
<td>Yes</td>
<td>7.00</td>
<td>11.23 *</td>
<td>1.34</td>
</tr>
<tr>
<td></td>
<td>No</td>
<td>0.62</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The respondents who were nursing large number of patients had 4.65 times increased risk of low back pain than those who had not nursed large number of patients. Those nurses who were carrying or moving heavy materials and equipment had 11.20 times increased risk of low back pain than those who had not carried or moved heavy materials and equipment. However in the case of nursing large number of patients and carrying or moving heavy
materials and equipment OR were >1. The OR (11.23) for nursing large number of patients and carrying or moving heavy materials and equipment were significant at 95% Confidence Interval. Thus it was found that there was significant relationship between prevalence of low back pain and occupational risk factors: nursing large number of patients and carrying or moving heavy materials and equipment. Hence research hypothesis was accepted for these variables.

Discussion

Assessment of prevalence of low back pain among staff nurses

The analysis of the data revealed that the prevalence of chronic low back pain (past twelve months) was 48.33%, which is supported by the supported by the study results conducted in Turkish hospital reported that 61.3% of respondents had occurrence of low back pain within the last 12 months. Moreover in the study done by Sikiru L and Shmaila H. (2009) found out that the 12 month prevalence of low back pain was 70.87%.

In the present study the 41.67% was the prevalence of acute low back pain (LBP past three months). In the study conducted by KarahanAzize et al. (2009) reported that prevalence of acute low back pain was 46.67%. Contrary, Harun-Ar and Rashid H.M. (2013) in their study also found the prevalence of acute low back pain was 21%.

Here the current prevalence of low back pain means the participants were experiencing low back pain at the time of the survey. The current prevalence rate among the staff nurses of STNM Hospital and Central Referral Hospital was 34.17% in the present study. The findings were supported by the study of Naude Benita (2008), Van Vuuren BJ et al (2005). The study conducted by Naude Benita (2008) in Johannesburg, South African hospital reported that the current prevalence rate of low back pain was 47%. Also the study done by Van Vuuren BJ et al. (2005) revealed that the current prevalence rate was 35.8% which was similar to the findings of the present study.

Association between low back pain and demographic variables

The present study findings revealed that there was significant association between low back pain and age and work experience at 0.05 percent level of significance. It also revealed that there was no significant association between low back pain and BMI, and work experience.
Low back pain and age:

The study findings revealed that 41.67% of respondents were between the ages of 21 to 50 years was suffering from low back pain. The present study reported that there was a significant association between low back pain and age at 0.05 level of significance, supported by the similar findings of the study done by various researchers are as follows: Ahmadi Mahnaz, et al. (2012) conducted a study in an Iranian Hospital, Kermanshah, and the sample size was 348 nurses who were randomly selected from two hospitals of Kermanshah, Imam Reza and Taleghani. The study reported that 34.8% of the nurses with low back pain belonged to age group 30 – 35 years.

Mostafa AF Abbas, et al. (2010) studied on prevalence and risk factors of low back pain among nurses in four tertiary care hospital at King Fahad Medical City, Riyadh, KSA. They reported low back pain was highest among younger age group who were less than 30 years old, (64.4%) compared to older nurses (>49 years old). Similarly, Dlungwane Thembelihle (2010) carried out a study on prevalence of low back pain among the nurses at Edendale Hospital, Durban, South Africa in 2010. The study reported that 68% of respondents were between the ages of 30 to 39 years were suffering from low back pain and was statistically significant at (p = 0.03).

Low back pain and BMI:

The data observed from the present study could not find significant association between low back pain and BMI. However, the prevalence of low back pain was highest among the nurses with normal BMI (18.5 – 24.9 kg/m^2). Though there was no significant association at p<0.05 but the trend was towards association as p value was 0.06. This may be because of less number of samples towards overweight and obese. So no study could be found to support the present study. In contrast the study conducted by: Aljeesh Yousef and Nawajha Samer Al (2011) conducted a cross sectional study on determinants of low back pain among operating room nurses in Gaza. The result revealed that 82.8% prevalence of low back pain among those who had body mass index (BMI) more than 30 kg/m^2. In another study done by Amany M Abou El-Soud et al. (2014) conducted a study to identify prevalence of low back pain in working nurses in Zagazig University Hospitals, and reported that there was a significant association between low back pain and body mass index (BMI) (p < 0.001).

Low back pain and work experience:
Data of the present study findings revealed a significant association between low back pain and ward/department at \((p=0.016)\). The prevalence of low back pain was high among nurses with work experience of 1 to 5 years. In support to the present study: another study conducted in the United Kingdom by Hollingdale R. (2010)\(^{19}\) revealed that a high proportion of younger nurses with minimal nursing experience had low back pain compared with older nurses that had more years in the profession.

**Assessment of relationship between prevalence of low back pain and physical risk factors**

The present study findings revealed that there was no significant relationship between low back pain and physical risk factors (exercise, smoking, pregnancy, spinal anaesthesia, affected activities of daily living).

**Low back pain and exercise:**

The present study finding does not reveal any statistically significant relationship between low back pain and exercise. However, risk of developing low back pain among the nurses who were not doing exercise was 0.58 times higher than that of nurses doing exercise \([OR=0.58; CI 0.28; 1.21]\). Similarly study conducted by Naude Benita(2008)\(^{12}\) reported that the majority of subjects participated in exercises although it was mainly for one to two times a week and participation in group exercises was a protective factor against low back pain.

**Low back pain and pregnancy:**

This study does not find statistically significant relationship between low back pain and pregnancy. Though the risk of developing low back pain among pregnant were 1.52 times more than those who had never been pregnant \([OR=1.52; CI 0.65; 3.5]\). However, the study conducted by Jimoh AAG et al. (2013)\(^{20}\) had reported that 55.4% of pregnant women experienced low back pain.

**Low back pain and spinal anaesthesia:**

In the present study, the findings could not reveal statistically significant relationship between low back pain and spinal anaesthesia. The risk of developing low back pain was 2.10 times more among those nurses who had exposure to spinal anaesthesia than those who were not exposed to spinal anaesthesia. Moreover, the study done by Rhee WJ, et al. (2010)\(^{21}\)
reveals that 13.4% of the patients refused spinal anaesthesia as they had previous experience of low back pain after exposure to spinal anaesthesia.

Assessment of relationship between prevalence of low back pain and psychological risk factors:

The present study findings revealed that there was statistically significant relationship between low back pain and occupational risk factors: nursing large number of patients and carrying or moving heavy materials and equipment.

Low back pain and nursing large number of patients

In the present study, findings revealed that there was statistically significant relationship between low back pain and nursing large number of patients. There was 4.65 times more risk of developing low back pain among the nurses those who were nursing large number of patients than those who were not nursing large number of patients. The study findings of Hashemian AH (2014)\textsuperscript{22} reported that nursing large number of patients increased the prevalence rate of low back pain.

Low back pain and carrying/moving heavy materials & equipment:

The present study findings revealed statistically significant relationship between low back pain and carrying or moving heavy materials and equipment. There was 11.23 times more risk of developing low back pain among those who were carrying or moving heavy materials and equipment than those who were not carrying or moving heavy materials and equipment.

Findings of the study done by Amany M Abou El-Soud et.al (2014)\textsuperscript{18} revealed that a higher incidence of low back pain was associated with lifting heavy loads. Also supported by the study done by MostafaAF Abbass, et al (2010)\textsuperscript{15} revealed that moving or supporting patients had a higher rate of low back pain. In another study conducted by Ozguler A et al. (2000)\textsuperscript{23} reported that carrying loads were often associated to low back pain.

Conclusion

In nutshell, prevalence of low back pain is on the rise and also age, marital status, ward/department and work experience had significant association with low back pain. Among the risk factors the occupational risk factor (nursing large number of patients in a day and
carrying or moving heavy materials and equipment) were statistically significant. Exercise had a positive impact on low back pain, thus every nurses needs to inculcate the habit of doing physical exercise either daily or at least thrice a week.

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