

Factors Associated with Low Back Pain among Nurses at Tertiary Level Hospital in Kathmandu

Subekshya Thapaliya¹, Ravi K Mishra², Krishna K Subedi³

Author(s) affiliation

¹Manmohan Memorial Institute of Health Science, Kathmandu

²Ministry of Health and Population, Kathmandu

³Manmohan Memorial Teaching Hospital, Kathmandu

Corresponding author

Subekshya Thapaliya, BNS, MN
subekshyamishra@gmail.com

Submitted

Jun 23, 2022

Accepted

Jul 31, 2022

ABSTRACT

Introduction

Nursing is a profession with high incidence and prevalence of low back pain with its medical and professional consequences. Personal and work-related factors are regarded as causal factors for back pain. The aim of study was to find out the Prevalence and contributing factors of low back pain among nurses working at a Tertiary level Hospital in Kathmandu.

Methods

A cross-sectional study was conducted among 290 nurses from different units/wards at Tribhuvan University Teaching Hospital. A self-administered, modified Nordic questionnaire and Keele Start Back Screening were used to collect data regarding prevalence of low back pain, its risk status and contributing factors. Descriptive statistics, inferential and univariate and multivariate logistic regression techniques were used for analysis.

Results

The findings of this study broadly confirm the high levels of back pain in nursing, with a one-year prevalence of low back pain of 84.1% for low back pain of at least one day and 21.92% among them were at high risk status. More than half (63.11%) of nurses reported from being prevented of carrying out normal activities. There was a significant association between low back pain and Age; 51-60 yrs ($p = 0.04$), body mass index; over weight ($p = 0.03$) and place of work; critical care unit ($p = 0.02$).

Conclusion

The prevalence of low back pain among nurses was high and should be actively addressed.

Keywords

Factors, low back pain, nurses

INTRODUCTION

The prevalence of low back pain (LBP) is high which causes serious suffering and disability than other health problems.¹ Nursing is an occupation most often susceptible to the risks of low back pain. The inherent nature of activities in nursing, such as twisting, bending, sustained posture, and repeated movements create favorable conditions for LBP.² In developed countries like USA and Australia, the prevalence of LBP ranges from 26.4% to 79.2% with lifetime prevalence of 85%.³ The study showed that 66% nurses suffered from LBP in Bangladesh.⁴ LBP results in loss of labor force, reduction in labor productivity and significant economic loss, it influences the society and the economy of the country where the individual lives.⁵ Although low back pain among nursing staff, has been a major health problem around the world, there is limited study on its prevalence in Nepal. Hence, LBP among nurses should be studied and comprehended profoundly.

METHODS

Ethical approval was obtained from IRC of the Manmohan Memorial Institute of Health Science (MMIHS) accompany with a letter of request for permission from MMIHS administration together with a copy of a study proposal to the Tribhuvan University Teaching Hospital (TUTH). A cross-sectional descriptive study design was used to determine prevalence and contributing factors among nurses at tertiary level hospital TUTH in Kathmandu. The study population of this study was defined as all the nurses working full time at the TUTH at the time of study. The Hospital has a total number of 672 nurses. Nurses working full time on those hospitals for at least one year by the time of the study were included in this study. Nurses on long leave and pregnant nurses were excluded. Sample size was calculated by using Cochran formula which was 290. Simple Random Sampling technique was adopted in order to select the study participants for the study. Number lists of all the population of TUTH staff Nurse was listed and 290 study subjects was selected randomly using lottery method from the total nurses. Verbal and written consent was taken from each respondent. Data was collected from September to October 2019 by using self-administered questionnaire. Due to changing work shifts, the questionnaire was administering to nurses and collecting immediately after completion as far as possible.

The data was analyzed using the software IBM SPSS Statistics 20 where descriptive statistics such as mean score and standard deviation, as well as frequency and percentages of all independent variables were used. Inferential statistics were applied to test associations of the LBP prevalence

and nurses personal as well as work-related characteristics. Univariate analysis was used to examine relationships between LBP and contributing factors. Odds ratio and corresponding 95 % confidence interval was used to find out the significance of association. Variables which were found statistically significant during bivariate analysis were further analyzed using logistic regression model in multivariate analysis.

RESULTS

As shown in table 1, age range varied from 20 years to above 60 years but more than half of respondents (68.6%) were in age of 20-29 years. Likewise, the highest numbers of respondents were Brahmins (40.3%) followed by Janajati (33%), Chhetri (20.3%) and lowest numbers (0.3%) were under others category that was kirat. Religion wise, majority respondents were Hindu (256) and two were under others category (kirat). Similarly, majority of respondents (78.3%) had Bachelor (BNS/BSc) degree and only 6.9% were there who had Master degree. More than half of respondents (154) were married and 136 respondents were un-married.

One of the important aspects of this study is to assess the prevalence of LBP in nursing. Prevalence of LBP was assessed by using modified Standard Nordic Questionnaire.

Table 1. Socio-demographic characteristics of the respondents (n=290)

| Characteristics | Number (%) |
|-----------------|------------|
| Age(years) | |
| 20-30 | 199 (68.6) |
| 31-40 | 69 (23.8) |
| 41-50 | 13 (4.5) |
| 51-60 | 9 (3.1) |
| Ethnicity | |
| Dalit | 1 (0.3) |
| Janajati | 96 (33.1) |
| Madhesi | 4 (1.4) |
| Muslim | 12 (4.1) |
| Brahmim | 117 (40.3) |
| Chhetri | 59 (20.3) |
| Others | 2 (0.3) |
| Religion | |
| Hindu | 256 (88.2) |
| Buddhist | 17 (5.8) |
| Christian | 3 (1.5) |
| Muslim | 12 (4.2) |
| Others | 2 (0.3) |
| Marital Status | |
| Unmarried | 136 (46.1) |
| Married | 154 (53.1) |

According to table 2 among 290 respondents, majority of respondents (84.1%, 95% C.I.: 79.4-88.1) had LBP and only 15.9% respondents does not have LBP. It signifies that majority of nurses in tertiary level hospital of Kathmandu had been experiencing LBP.

Table 3 shows the association between socio-demographic factors of nurses and LBP. Odds ratio found to be significant ($p=0.04$) in the age group 51-60 years of respondents.

Table 2. Prevalence of low back pain among nurses in the past 12 months ($n=290$)

| Low back pain | Number (%) | 95% CI |
|---------------|------------|-------------|
| Present | 244 (84.1) | (79.4-88.1) |
| Absent | 46 (15.9) | (11.8-20.6) |

Table 4 shows the association between personal factors and occurrence of Low back pain. Among these different category of weights, only over weight was significantly ($p= 0.02$) associated with LBP. However an obese nurse does not show the risk of LBP. Designation, experiences and regular exercise each were not showing significant association with LBP among nurses

Table 5 shows only one factor critical care unit was significantly associated with LBP ($p=0.02$). There is 3.22 times risk of having LBP for those who were working in critical care unit. However factors such as time of shift, frequency of assisting patients during shifts, helping patients in mobilizing during shifts, poor body mechanics/working postures, frequent carrying of heavy medical equipment during shifts were not significantly associated with LBP among nurses.

Table 3. Bivariate analysis between socio-demographic factors and LBP ($n=290$)

| Socio-demographic factors | LBP | | OR | 95% C.I. | p-value |
|---------------------------|------------|-----------|------|---------------|---------|
| | Present | Absent | | | |
| Age (years) | | | | | |
| 20-30 ® | 167 (83.9) | 32 (16.1) | 1.00 | - | 0.02 |
| 31-40 | 63 (91.3) | 6 (8.7) | 2.01 | (0.80 -0.504) | 0.13 |
| 41-50 | 9 (69.2) | 4 (30.8) | 0.43 | (0.13 -1.48) | 0.18 |
| 51-60 | 5 (55.6) | 4 | 0.24 | (0.06 -0.94) | 0.04* |
| Marital Status | | | | | |
| Unmarried ® | 113 (83.1) | 23 | 1.00 | (0.61-2.17) | 0.64 |
| Married | 131 (85.1) | 23 | 1.16 | | |

*Significant at $p<0.05$

® Reference Category

Table 4. Bivariate analysis between personal factors and LBP ($n=290$)

| Personal factors | LBP | | OR | 95% C.I. | p-value |
|----------------------|------------|-----------|------|--------------|---------|
| | Present | Absent | | | |
| BMI | | | | | |
| Normal weight ® | 154 (81.5) | 35 (18.5) | 1.00 | | 0.16 |
| Under weight | 22 (84.6) | 4 (15.4) | 1.25 | (0.40-3.86) | 0.69 |
| Over weight | 52 (94.5) | 3 (5.5) | 3.93 | (1.16-13.35) | 0.02* |
| Obese | 16(80.0) | 4 (20) | 0.90 | (0.28-2.88) | 0.87 |
| Designation | | | | | |
| Ward Incharge ® | 13 (72.2) | 5 (27.8) | 1.00 | | 0.16 |
| Staff Nurse | 231 (84.9) | 41 (15.1) | 2.17 | (0.73-6.40) | |
| Experience(in years) | | | | | |
| 1-5 | 157 (84.9) | 28 (15.1) | 1.00 | | 0.59 |
| 6-10 | 5 (83.8) | 11 (16.2) | 0.92 | (0.43-1.98) | 0.83 |
| 11-15 | 16 (94.1) | 1 (5.9) | 1.43 | (0.31-0.16) | 0.64 |
| > 15 | 14 (70) | 6 (30) | 0.50 | (0.16-1.50) | 0.21 |
| Regular Exercise | | | | | |
| No ® | 204 (85.4) | 35 (14.6) | 1.00 | | 0.22 |
| Yes | 40 (78.4) | 11 (21.6) | 0.62 | (0.29-1.33) | |

*Significant at $p<0.05$

® Reference Category

Table 5. Bivariate analysis between work-related factors and LBP (n=290)

| Work related Factors | LBP | | OR | 95% C.I. | p-value |
|--|------------|-----------|------|--------------|---------|
| | Present | Absent | | | |
| Ward | | | | | |
| General ward ® | 110 (80.9) | 26 (19.1) | 1.00 | | 0.16 |
| Emergency | 23 (85.2) | 4 (14.8) | 1.36 | (0.43-4.27) | 0.59 |
| Critical care | 68 (93.2) | 5 (6.8) | 3.22 | (1.18-8.77) | 0.02* |
| OperationTheatre | 35 (77.8) | 10 (22.2) | 0.83 | (0.36-1.88) | 0.65 |
| OPD | 8 (88.9) | 1 (11.1) | 1.89 | (0.23-15.79) | 0.55 |
| Time of Shift | | | | | |
| Days only ® | 18 (72.0) | 7 (28.0) | 1.00 | | 0.08 |
| Shift Wise | 226 (85.6) | 39 (14.7) | 2.25 | (0.88-5.75) | |
| Patient Assistance | | | | | |
| No ® | 81 (84.4) | 15 (15.6) | 1.00 | | 0.71 |
| Yes | 163 (84.5) | 30 (15.5) | 0.88 | (0.45-1.72) | |
| Number of patient require assistance in mobilizing | | | | | |
| 0 ® | 19 (73.1) | 7 (26.9) | 1.00 | | 0.42 |
| 1-5 | 177 (85.1) | 31 (14.9) | 2.12 | (0.82-5.45) | 0.12 |
| 6-10 | 37 (84.1) | 7 (15.9) | 1.95 | (0.60-6.37) | 0.27 |
| 11-15 | 10 (90.9) | 1 (9.1) | 3.68 | (0.40-34.2) | 0.25 |
| Lifting heavy objects | | | | | |
| No ® | 81(84.4) | 15 (15.6) | 1.00 | | 0.64 |
| Yes | 163 (84.5) | 30 (15.5) | 1.16 | (0.61-2.18) | |
| Maintained body mechanics/ working postures | | | | | |
| Yes ® | 76 (80.0) | 19 (20.0) | 1.00 | | 0.18 |
| No | 168 (86.2) | 27 (13.8) | 1.56 | (0.82-2.97) | |

*Significant at p<0.05

® Reference Category

Table 6. Significant contributing factors of LBP among nurses

| Independent Variables | OR | 95% C.I. | p-value |
|-----------------------|-------|--------------|---------|
| Age (in year) | | | |
| 20-30 ® | 1.00 | | 0.01 |
| 31-40 | 1.77 | (0.67-4.63) | 0.24 |
| 41-50 | 0.381 | (0.09-1.56) | 0.17 |
| 51-60 | 0.090 | (0.01-0.57) | 0.01 |
| BMI | | | |
| Normal weight ® | 1.00 | | 0.08 |
| Under weight | 1.21 | (0.38-3.88) | 0.74 |
| Over weight | 6.23 | (1.52-25.57) | 0.01 |
| Obese | 1.03 | (0.27-3.90) | 0.96 |
| Ward | | | |
| General Ward ® | 1.00 | | 0.15 |
| Emergency | 1.29 | (0.40-4.17) | 0.66 |
| Critical care | 3.26 | (1.17-9.09) | 0.02 |
| OT | 0.96 | (0.41-2.28) | 0.93 |
| OPD | 4.40 | (0.37-52.86) | 0.24 |

*Significant at p<0.05

® Reference Category

Multiple logistic regression analysis was used to identify the most significant factors associated with LBP. The outcome variable LBP is coded '0' for no LBP and '1' for having LBP. The variables namely age, weight and ward each had come up significant in bivariate analysis. These variables were used in multiple logistic regression model and the results were presented in table 6.

According to table 6, among these three variables age group 51-60 years ($p=0.01$), over weight ($p=0.01$) and critical care ($p=0.02$) only were significantly associated with LBP.

DISCUSSION

In the present study, 84.1% of all nurses reported experiencing LBP, for at least one day, during the last 12 months preceding the data collection. Compared with the research findings from similar studies previously undertaken in Nepal which revealed a 75.7%⁶ and 78%⁷ LBP level the findings of this study reveal a somewhat higher prevalence of LBP. The association between advanced age and LBP was reported by several authors which is similar with the present study.⁸ Another study showed that nurses between 50-59 years were most affected by LBP.⁹ This association can be explained by the resistance reduction to the dynamic work observed in advanced age because of the frequent spine degenerative processes. In the present study it has been observed that there is significant association between the critical care nurses and LBP which is consistent with the study done in Jordan where the highest percentage of back pain was among critical care nurses.¹⁰ Similar results were obtained in the study done in Malaysia.¹¹ In critical care unit, most patients are usually dependent, frail and need more help from nurses for their daily activities and transfer compared to those in other wards.

CONCLUSION

Low back pain is frequent among nurses. The results of this study demonstrated that the prevalence of low back pain among nurses at TUTH was high. One socio-demographic factor (age), one personnel factor (BMI-overweight) and one work-related factor (working unit) were significantly related to low back pain. Others factors of socio-demographic, personal and work-related were not associated with low back pain among the nurses. Low back pain is highly prevalent in the studied population and is, therefore, considered a major concern, with consequences on both individual and governmental levels. Hence, more light should be shed on the matter to help reduce its prevalence and its ensuing effects.

FINANCIAL SUPPORT

The author(s) did not receive any financial support for the research and/or publication of this article.

CONFLICT OF INTEREST

The author(s) declare that they do not have any conflict of interest with respect to the research, authorship, and/or publication of this article.

ACKNOWLEDGEMENT

We would like to thank Dr Shankar Khanal for his valuable guidance and support throughout the study period. We express our gratitude to hospital directors and nursing director of the TUTH hospitals for sanctioning permission to collect data and for providing amicable environment during the data collection. Our due thanks go toward supervisor, ward incharges and all participants who gave us their precious time to participate in the study. Without their help, support and cooperation, this study would have been utterly impossible.

REFERENCES

1. Kamper SJ, Apeldoorn AT, Chiarotto A, et al. Multidisciplinary biopsychosocial rehabilitation for chronic low back pain: Cochrane systematic review and meta-analysis. *BMJ*, Canada 2015 Feb 18; (350): 1-2.
2. Vrbanić TS. Low back pain--from definition to diagnosis. *Reumatizam*. Croatia 2011; 58(2):105-7.
3. Louw QA, Morris LD, Grimmer-Somers K. The Prevalence of low back pain in Africa: a systematic review. *BMC Musculoskeletal Disord*. 2007 Nov 1;8:105.
4. Prevalence of Low Back Pain among The Nurses: http://library.crp-bangladesh.org:8080/xmlui/bitstream/handle/123456789/60/H_M_Harun_Ar_Rashid_1005.pdf?sequence=1&isAllowed=y [cited 2019 Aug 11].
5. Monteiro MS, Alexandre NMC, Ilmarinen J, Rodrigues CM. Work ability and musculoskeletal disorders among workers from a public health institution. *Int J Occup Saf Ergon JOSE*. 2009;15(3):319-24.
6. Manandhar N, Subedi S. Prevalence and Risk factors of Low back pain among nurses of a Medical College at Bharatpur: SCIREA, 2016 Oct 16;(6)10.
7. Mekonnen TH. Work-Related Factors Associated with Low Back Pain Among Nurse Professionals in East and West Wollega Zones, Western Ethiopia, 2017: A Cross-Sectional Study. *Pain Ther*. 2019 Dec;8(2):239-47.
8. Yip Y. A study of work stress, patient handling activities and the risk of low back pain among nurses in Hong Kong. *J Adv Nurs*. 2001 Dec;36(6):794-804.
9. Béjia I, Younes MWF, Jamila HB, Khalfallah T, Salem KB, Touzi M, et al. Prevalence and factors associated to low back pain among hospital staff. *Jt Bone Spine Rev Rhum*. 2005;72 (3):254-9.
10. Shawashi TO, Subih MM, Al Hadid LAR, Abu Adas M. Occupational-related back pain among Jordanian nurses: A descriptive study. *Int J Nurs Pract*. 2015 May;21 Suppl 2:108-14.
11. Gim C. Factors Associated with Low Back Pain Among Nurses in Critical Care Units, Hospital Universiti Sains Malaysia. *Biomed J Sci Tech Res*. 2017 Dec 20;(1):2027-2029.