BASIC SCIENCES/OTHERS

THE PREVALENCE OF LOW BACK PAIN IN NURSES AT A UNIVERSITY HOSPITAL IN THE EASTERN AREA OF SÃO PAULO

PREVALÊNCIA DE DOR LOMBAR EM ENFERMEIROS EM UM HOSPITAL UNIVERSITÁRIO DA ZONA LESTE DE SÃO PAULO

PREVALENCIA DE DOLOR DE LA REGIÓN LUMBAR EN ENFERMEROS DE UN HOSPITAL UNIVERSITARIO DE LA ZONA ESTE DE SÃO PAULO

FELIPE RAMALHO GUEDES[1], FERNANDA MINUTTI NAVARRO[1], RODRIGO YUITI NAKAO[1], ISABELA PAGLIARO FRANCO[2], LUIZ CLAUDIO LACERDA RODRIGUES[1]

1. Hospital Santa Marcelina, Orthopedics and Traumatology Department. São Paulo, SP, Brazil.
2. Faculdade Santa Marcelina, São Paulo, SP, Brazil.

ABSTRACT

Objective: To evaluate the prevalence of low back pain in nurses at a university hospital in São Paulo and establish a relationship with social aspects. Methods: A cross-sectional study was carried out, through the application of a questionnaire containing social questions(weight, age, height, work sector, working hours, physical activity, presence and frequency of low back pain) in addition to the Oswestry questionnaire. Results: One hundred fifty-three nurses participated in the study. Of these, 92.30% of the women and 73.91% of the men presented low back pain, with a third classifying the pain as sporadic. In relation to BMI, pain is lower in those who are underweight (60%) and higher among those who are overweight (96.77%). Most of the sample was sedentary (66%), and of these, 96% had low back pain. There was no difference in the comparison by working hours, in relation to work sector, pain was more present in the following sectors: coordination (100%); children's ward (92%); adult emergency room (90%) and adult ICU (31%). Thirty nurses worked double shifts, and of these, 90% reported low back pain, while among those who worked only at the university hospital, 89.4% reported pain. In relation to working hours, the longer the working day, the greater the pain. In the function assessment (Oswestry), 99 participants obtained a value of up to 30% disability. Conclusion: Based on the results of this work, it is concluded that there is a high prevalence of low back pain in nurses at the Hospital Universitário; however, it was not possible to determine a direct risk factor associated with this high prevalence. **Level of Evidence IV; Cross-sectional study.**

Keywords: Low Back Pain; Nurses; Cross-Sectional Studies.

RESUMO

Objetivo: Avaliar a prevalência de dor lombar em enfermeiros de um hospital universitário da zona leste de São Paulo e estabelecer relação com aspectos sociais. Métodos: Foi realizado um estudo de corte transversal, através da aplicação de um questionário contendo questões sociais (peso, idade, altura, setor de trabalho, carga horária, prática de exercício físico, presença e frequência de dor lombar), além do questionário Oswestry. Resultados: Cento e cinquenta e três enfermeiros participaram do estudo, destes 92,30% das mulheres e 73,91% dos homens apresentaram dor lombar, sendo que um terço classificava a dor como esporádica. Em relação ao IMC, a dor é menor naqueles que estão abaixo do peso (60%) e maior entre aqueles que se apresentam sobrepeso (96,77%). A maioria da amostra era sedentária (66%), sendo que destes, 96% apresentavam dor lombar. Não houve diferença na comparação para período de trabalho, já em relação ao setor de trabalho a dor estava mais presente no setor de coordenação (100%), seguido por enfermaria infantil (92%), pronto socorro adulto (90%) e UTI adulto (31%). Trinta enfermeiros faziam dupla jornada, e destes, 90% relataram dor, já nos que trabalhavam somente no hospital universitário 89,4% relataram dor. Em relação à carga horária, quanto maior a jornada, mais dor. Na avaliação da função (Oswestry), 99 participantes obtiveram um valor de até 30% de incapacidade. Conclusão: A partir dos resultados deste trabalho, conclui-se que existe uma alta prevalência de dor lombar nos enfermeiros do Hospital Universitário, no entanto, não foi possível determinar um fator de risco direto associado à esta alta prevalência. **Nível de Evidência IV; Estudo de corte transversal.**

Descritores: Dor Lombar; Enfermeiras e Enfermeiros; Estudos Transversais.

RESUMEN

Objetivo: Evaluar la prevalencia del dolor de la región lumbar en enfermeros y enfermeras de un hospital universitario de la zona este de São Paulo y establecer una relación con los aspectos sociales. Métodos: Se realizó un estudio transversal aplicando un cuestionario que contenía preguntas sociales (peso, edad, altura, sector laboral, carga de trabajo, práctica de ejercicio físico, presencia y frecuencia de dolor en la región lumbar), además del cuestionario de Oswestry. Resultados: Participaron del estudio 153 enfermeros y enfermeras, de los cuales el 92,30% de las mujeres y el 73,91% de los hombres presentaban dolor en la región lumbar, y un tercio clasificaba el dolor como esporádico. En cuanto al IMC, el dolor es menor en los que tienen un peso inferior al normal (60%) y mayor entre los que tienen sobrepeso (96,77%).La mayoría de la muestra era sedentaria (66%), y de ellos, el 96% presentaba lumbalgia. No hubo diferencias en la comparación

por período de trabajo, pero en cuanto al sector de trabajo, el dolor estuvo más presente en el sector de: coordinación (100%); seguido de la sala infantil (92%); urgencias de adultos (90%) y UCI de adultos (31%). Treinta enfermeros y enfermeras trabajaban en doble turno, y de ellos, el 90% manifestó dolor, mientras que de los que trabajaban sólo en el hospital universitario, el 89,4% manifestó dolor. En cuanto a la carga de trabajo, cuanto más largo es el turno, más dolor. En la evaluación de la función (Oswestry), 99 participantes obtuvieron un valor de hasta un 30% de incapacidad. Conclusión: A partir de los resultados de este estudio, se concluye que existe una alta prevalencia de dolor de la región lumbar en enfermeros y enfermeras del Hospital Universitario, sin embargo, no fue posible determinar un factor de riesgo directo asociado a esta alta prevalencia. **Nivel de Evidencia IV; .Estudio Transversal.**

Descriptores: Dolor de la Región Lumbar; Enfermeras y Enfermeros; Estudios Transversales.

INTRODUCTION

Low back pain is a manifestation of pain, muscle spasms, or stiffness located below the margin of the twelfth rib and above the gluteal fold, and may or may not be associated with pain radiating to the lower limb(s).[1] Low back pain has been described as just a symptom and may be a clinical manifestation of different diseases located in the spine or in other organs.[1]

There is agreement on the high prevalence of occupational musculoskeletal disorders, especially in the lumbar region.[2-4] Epidemiological studies show that 50 to 90% of adults interviewed have low back pain at some point in their lives.[5]

In industrialized countries, low back pain is the main cause of disability in people under 45 years of age.[6] Its incidence is practically the same in men and women.[6]

In the United States, low back pain is considered a problem with high medical and social costs, causing a loss of 1400 working days per year for every thousand inhabitants.[7] In Europe, it is the main cause of limitation in people under 45 years of age and the second most common reason for medical consultations.[7]

Around a third of Brazilians claimed that their work activities and interpersonal relationships had already been affected by pain.[8] Therefore, low back pain is a medical, economic, and social issue.[5]

According to the WHO, back pain can be correlated to various risk factors, which can be divided into individual and occupational risk factors. Likely individual risk factors include age, sex, weight/height ratio, muscle strength capacity, socioeconomic conditions, and the presence of other diseases.[9,10]

On the other hand, excessive load on the lumbar spine caused by lifting weight, moving heavy objects, remaining seated for extended periods of time, poor posture, and prolonged exposure to vibrational stimuli stand out among the occupational risk factors.[10]

In addition, risk factors may be related to the type of work that the individual does. Some work environments, such as construction and industries with cargo transport, followed by nursing, are statistically classified as higher risk.[11]

Following a review of 132 articles conducted in 2015 that addressed musculoskeletal injuries among nurses, it was found that the mean prevalence of low back pain was 55% in the last 12 months.[2]

Nursing can be classified as strenuous work, as it involves activities such as transferring patients from beds and gurneys, and changing the position of patients unable to move on their own. These movements requires physical strength, bending and frequent twisting of the spine, maintaining posture in static work activities, and repetitive work.[12]

The most common diagnosis for back pain related to nursing work is muscle strain related to handling patients who are unable to move.[13]

Therefore, incorrect posture, failure to follow the rules of body biomechanics, and excessive handling of loads can be considered factors inherent to nurses' working conditions that, due to physical wear and tear, favor the onset of low back pain.[14]

The main objective of this study was to determine the prevalence of low back pain in the nursing team at a university hospital in the city of São Paulo. The secondary objectives were to verify any correlations between age, sex, body mass index (calculated as weight in kilograms divided by height in meters squared), the practice of physical exercise, work sector, work shift, and the degree and frequency of restrictions on daily activities caused by low back pain.

METHODS

This study is an epidemiological, cross-sectional cohort of a sample of 153 nurses of both sexes on the nursing team of a university hospital located in east São Paulo. It was submitted to and approved by the Institutional Review Board. All procedures were conducted in compliance with the ethical standards of the committee responsible for human experimentation (institutional and national) and the 1975 Declaration of Helsinki, revised in 2008.

Data collection began in January 2018 after the study was approved. The Informed Consent Form (ICF) was given to the participants and explained. During the period from January to March 2018, and once they had signed the form, they answered the Oswestry questionnaire, in addition to some questions to determine social characteristics such as age, sex, BMI, weekly working hours, sector, presence and frequency of low back pain, and regular practice of physical exercise in the different shifts and hospital units.

Employees who were on sick leave or other type of leave during the data-collection period, employees with less than three months on the job, and those who refused to sign the Informed Consent Form were excluded. Participation in the study was voluntary and all subjects who agreed to participate signed the ICF.

Data analysis

The data analysis process of the present study began with a descriptive exploration resulting in frequency tables for the qualitative variables, with the inclusion of the confidence interval (CI95%) for the proportion. Median and interquartile interval statistics were calculated for the quantitative variables and the Kolmogorov-Smirnov normality test was applied to all variables of this nature to evaluate their probability distribution.

Either the Fisher's exact test or the chi-square test was used to study the relationship between the qualitative variables. The odds ratio estimator with CI95% was used to quantify the effect of the different factors on the outcome. The Mann-Whitney test was used to compare two independent groups in the case of quantitative variables.

All tests performed considered a bidirectional α of 0.05 and a confidence interval (CI) of 95% and were conducted with the computational support of IBM SPSS 25 (Statistical Package for the Social Sciences) and Excel 2010® (Microsoft Office) software.

RESULTS

One hundred and fifty-three out of a total of 276 nurses employed by a university hospital participated in the study. Most were female (84.97%), and the mean age was in the 30-to 40-years-of-age range. The body mass index (BMI) was calculated as the weight in kilograms divided by the height in centimeters squared, resulting in 35.29% of the participants with an ideal value and 40.52% of the participants classified as overweight.

Around 90% of the participants reported a history of low back pain at least once in their lifetime. About a third of those who gave a positive response for pain classified it as sporadic. (Table 1) In addition, 92.30% of the women and 73.91% of the men gave a positive response for low back pain. (Table 2) The 30- to 40-year-old age group had the highest number of participants with low back pain, with 92.39% of the responses positive for pain. (Table 2)

When compared by BMI, pain appears in all ranges, but lower

among those who are underweight (60%) and higher among those in the overweight range (96.77%). (Table 3)

In addition, 66% of the study participants did not practice physical exercise. Low back pain was present in 96% of the nurses who did not practice physical exercise and in 76% of those who did practice physical exercise. (Table 3)

Among the 137 nurses who answered yes for low back pain, the responses were homogeneous by work period. (Table 4) When compared by sector, the nurses who worked in hospital coordination showed a positive response for pain of 100%, those who worked in the children's ward of 92%, in the adult ICU of 31%, and in the adult emergency room of 90% positive response to low back pain. (Table 4)

The nurses who worked double shifts were a minority among the study participants. However, 90% of the nurses who worked other jobs presented pain. Among those without other jobs, the positive pain response was 89.4%. (Table 5)

In the comparison by workload, 93.75% of those who worked 41 to 44 hours a week and 88.75% of those who worked less than 36 hours a week gave a positive response for low back pain. (Table 5)

Finally, we analyzed the data obtained from the Oswestry Disability Index questionnaire, which is a tool consisting of 10 questions, each with six response alternatives, assigned values ranging from 0 to 5. The first question assesses pain intensity and the other nine evaluate the effect of pain on daily activities, such as personal care (getting dressed and bathing), lifting weight, walking, sitting, standing, sleeping, sexual life, social life, and getting around.

Table 1. Pain frequency among the participants with a positive response for low back pain.

| | | N(%) 137(100) | CI95% | |
			Lower	Upper
Pain frequency	Daily	17(12.4)	7.7	18.7
	Weekly	36(26.3)	19.5	34.1
	Monthly	32(23.3)	16.9	30.9
	Sporadic	52(38.0)	30.2	46.3

Table 2. Positive and negative participant responses for low back pain by sex and age range.

| | | Low Back Pain | | |
		No	Yes	Total
Sex	Female	10	120	130
	Male	6	17	23
	Total	16	137	153
Age range	<=30 years	3	25	28
	30 -- 40 years	7	85	92
	40 -- 50 years	5	25	30
	50 -- 60 years	0	2	2
	>60 years	1	0	1
	Total	16	137	153

Table 3. Positive and negative participant responses for low back pain by body mass index and practice of physical exercise.

| | | Low Back Pain | | |
		No	Yes	Total
BMI Classification	Underweight	2	3	5
	Ideal weight	5	49	54
	Overweight	2	60	62
	Obesity I	4	21	25
	Obesity II	3	4	7
	Total	16	137	153
Physical exercise	No	4	97	101
	Yes	12	40	52
	Total	16	137	153

BMI: body mass index.

In our quantification of how disabling low back pain can be, we observed that 99 of the participants scored up to 30% disability for activities when experiencing low back pain. That is, 65.56% of the participants who answered that they had had pain at some point in their lives had failed to perform approximately 1/3 of their daily activities due to low back pain. The mean degree of disability from low back pain was 28%. However, there were some outliers as shown in Figure 1.

DISCUSSION

One hundred and fifty-three nurses, accounting for 55.43% of the 276 nurses employed by a university hospital in São Paulo, participated in the present study. One hundred and thirty-seven (89.54%) of the nurses included in the study had low back pain. Considering that the total number included active-duty nurses, as well as those on sick leave, vacation, those hired within the previous three months, and those who opted not to sign the Informed Consent Form, the participation in the study was significant.

Table 4. Positive and negative participant responses for low back pain by work shift and sector.

| | | Low Back Pain | | |
		No	Yes	Total
Shift	Morning	3	36	39
	Afternoon	6	34	40
	Night	6	36	42
	Full-time	1	31	32
	Total	16	137	153
Sector	Adult Ward	8	63	71
	Pediatric Ward	1	12	13
	Adult ICU	3	31	34
	Pediatric ICU	1	3	4
	Adult Emergency Room	2	18	20
	Pediatric Emergency Room	1	2	3
	Coordination	0	8	8
	Total	16	137	153

ICU: intensive care unit.

Table 5. Positive and negative participant responses for low back pain by weekly workload in the teaching hospital and by double work shift.

| | | Low Back Pain | | |
		No	Yes	Total
Weekly workload in the teaching hospital	≤36 hours	10	71	80
	37 -- 40 hours	2	10	12
	41 -- 44 hours	2	30	32
	>44 hours	2	26	28
	Total	16	137	152
Double work shift	No	13	110	123
	Yes	3	27	30
	Total	16	137	153
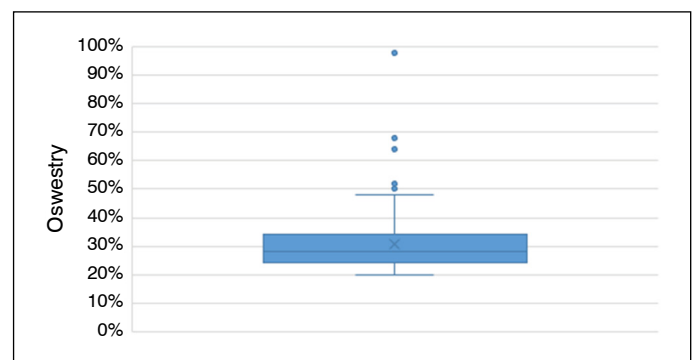
Figure 1. Graph of the degree of disability related to low back pain (Oswestry) for patients who presented a positive response for pain.

Among the participants, 90% reported back pain at least once in their lifetime. The occurrence of low back pain in nurses has been constant. A 12-month study of nurses conducted at the Centro Hospitalar Tondela-Viseu, in Portugal, reported a prevalence of low back pain of 78.6%.[15] A Brazilian study presented a prevalence ranging between 43% and 93%.[16] Despite the high rate of low back pain, most classified it as sporadic, that is, with a frequency less than once a month.

In our analysis of some similar studies,[17-19] we found that the highest prevalence of low back pain was most commonly in the group ranging from 30 to 40 years of age. According to the results of the present study, this information was confirmed, as 92.39% of the respondents in the 30- to 40-year-old group had low back pain.

However, it was not possible to establish any relationship between pain and increasing age. In other words, age is not considered a risk factor in view of the results of this study.

Women were more affected by low back pain, but sex was not a determining factor for this. Other studies[20-22] have also reported a higher prevalence of low back pain in females and have associated this fact to some functional anatomical characteristics, such as smaller stature, less developed muscle mass, less bone mass, joints that are both more fragile and less adapted to strenuous physical effort, and a higher percentage of body fat.

Unlike some studies,[23,24] which present a linear increase in the prevalence of low back pain in relation to an increase in BMI, the current study showed a significant presence of low back pain among overweight nurses. The presence of low back pain also presented significant values in the ideal weight range, as well as in the overweight, obesity I, and obesity II weight ranges, indicating that an increase in the BMI is not a direct risk factor for low back pain.

Some studies[25,26] consider work shift, working hours, and the sector worked in to be risk factors for low back pain in nurses. This is justified by poor working conditions, such as inadequate pay, long working hours with no break, and uncomfortable or tiring work shifts (such as the night shift).

However, the present study did not confirm an increase in low back pain associated with long hours or full-time and night shifts. We were able to observe a high low back pain rate among nurses who worked in the coordination unit, that is, among those who remain seated for extended periods and do not tend to carry weight. According to a Brazilian study,[27] occupations in which the worker remains seated for long periods of time is a factor positively associated with low back pain.

Most of the nurses in this university hospital did not have another job and pain rates were high regardless of this factor. Therefore, it was not possible to establish a relationship.

In addition, long weekly work hours could not be considered a risk factor for low back pain because while 93.75% of the nurses working 41-44 hours per week were positive for low back pain, 88.75% of those working less than 36 hours a week had a positive response, indicating that there was no exponential increase in the presence of pain related to an increase in the weekly work load. In any case, the low back pain rates were extremely high.

Regarding physical exercise, approximately two thirds, or 66%, of the responding nurses did not practice regular physical exercise. A study conducted at the Hospital das Clínicas of the Federal University of Minas Gerais reported that 55% of the nurses interviewed did not perform any type of physical exercise.[14] Therefore, while physical exercise cannot be considered a protective factor, low back pain was more common among those who did not practice physical exercises. This can be explained by the lack of muscle conditioning for performing nursing tasks.[14]

Our analysis of the Oswestry Disability Index (ODI) scores resulted in a mean participant disability of 28%, that is, moderate disability for daily activities when they are experiencing low back pain. It is worth remembering that the ODI score classifications are minimal disability (0-20%), moderate disability (21-40%), severe disability (41-60%), patient unable to perform daily activities (61-80%), and bedridden (81-100%).[28]

According to a study conducted in 2003 by UNICAMP, chronic non-specific low back pain can rarely cause total inability to perform daily activities. On the other hand, it can cause partial or temporary disability, and often with greater frequency.[29] This fact agrees with the results found in our study, where the complaint of pain in the lumbar region was not viewed as an important disability factor, but only as a limitation to performing certain daily activities.

Furthermore, the work of Foss et al. in 2009 showed that, despite the high prevalence of low back pain in a population of staff nurses at a university hospital, this manifestation was not disabling to the point of causing repercussions such as increased absenteeism.[30]

CONCLUSION

From the results of this study, we concluded that there was a high prevalence of low back pain among nurses at this university hospital.

It was not possible in this study to determine a direct risk factor for low back pain. We believe that some factors such as sex, age, BMI, sedentary lifestyle, working hours, sector worked in, posture, and work activities taken together may predispose the employee to low back pain.

All authors declare no potential conflict of interest related to this article.

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