THE CORRELATION AMONG LEVEL OF KNOWLEDGE OF ERGONOMICS AND LOW BACK PAIN COMPLAINTS IN INPATIENT NURSES

Novilia Velisya Tumpia[1], Lidesdianty Juwita Natalia Kadja[1], Yulius Dicky Candra[1], Ineke Patrisia[2*], Santa Maya Pramusita[2]
[1-2]Faculty of Nursing, Universitas Pelita Harapan, Tangerang, Indonesia
E-mail: ineke.patrisia@uph.edu

ABSTRACT
Low Back Pain (LBP) is a collection of several clinical symptoms that are marked by pain or discomfort in the lower back, which may or may not extend to the legs. Incorrect ergonomics is the primary factor contributing to lower back pain (LBP) among nurses. The objective of this study was to establish a correlation between the extent of ergonomics knowledge and the occurrence of lower back pain (LBP) complaints among nurses who work with hospitalised patients. This study employed a correlational quantitative design, utilising a cross-sectional technique. The sample size for this study consisted of 158 nurses working in the inpatient unit of a private hospital in Indonesia. The sampling technique employed was a total sampling, resulting in a sample size of 158 nurses. The research employed questionnaires that were both valid and trustworthy. The questionnaires assessing knowledge of ergonomics were devised by Bunga et al. (2019), whilst the questionnaire pertaining to low back pain was formulated by Deria (2021). The findings of the Pearson chi-square statistical test indicated a p-value of 0.105, suggesting that there was no statistically significant association between the level of knowledge of ergonomics postures and complaints of low back pain among inpatient nurses. Inpatient nurses have the ability to discover and implement ergonomic postures in their regular tasks. Further research could be undertaken on the elements that can induce low back discomfort..
Keywords: Ergonomics, Knowledge, Nurses, Low Back Pain

INTRODUCTION

Low back pain (LBP) is a prevalent global health issue and a frequent source of work-related health complications, particularly among healthcare professionals, notably in the nursing field (Dlungwane et al, 2018). The prevalence of LBP cases among health personnel in France varies from 15% to 45% on a global scale. The prevalence of lower back pain (LBP) in the United States is reported to be 13.1% among those aged 20-69 years (Allegri et al., 2016). In Indonesia, the 2018 survey conducted by Riset Kesehatan Dasar (Riskesdas) revealed that the prevalence of musculoskeletal disease was 7.30%. Moreover, according to a doctor's diagnosis, the region with the highest occurrence of musculoskeletal disease was Aceh, with a prevalence rate of 13.26%. This was followed by Bengkulu at 12.11%, Bali at 10.46%, Papua at 10.43%, and Banten at 6.15%.

Multiple studies have indicated that the primary factors that increase the risk of lower back pain (LBP) in nurses include the act of lifting and moving patients, maintaining an unstable body posture, inadequate work organisation, improper ergonomic positioning, unsuitable job design, limited social support, low job satisfaction, staff shortages, and

unfavourable working conditions (Dlungwane, 2018). Incorrect ergonomics or excessive workload might lead to low back pain (Sulistyaningtyas, 2022). Suma'mur (2014) and Sulistyaningtyas (2022) have identified certain activities that might lead to lower back pain (LBP), including pulling, pushing, lifting, carrying large weights, and performing these actions with improper posture. Chronic lower back pain (LBP) can often lead to significant suffering and hinder the productivity of nurses. It can also result in physical disability and other detrimental consequences for nurses, affecting both their personal lives and their families (Tariq et al., 2023).

Adopting an ergonomic posture is necessary when working or performing a task in order to enhance safety, increase job productivity, and minimise work-related hazards (Prapti et al., 2020). One way to apply ergonomic principles to work is by alternating between standing, sitting, and walking positions. The height of the desk or table should be adjusted according to the specific task at hand. For men, the maximum height should be 110 cm, while for women it should be 105 cm. The minimum height for both men and women should be 90 cm and 85 cm, respectively (Marbun, 2020). Poor posture, characterised by a constant downward gaze, forward protrusion of the shoulders, stomach, and lower back, can lead to muscle strain. This is the primary factor contributing to lower back pain.

Incorrect posture and insufficient understanding of optimal ergonomic positions are the primary contributing reasons to lower back pain (LBP) among nurses (Gaowgzeh, 2019). The importance of having correct posture is frequently overlooked. It is concerning that a significant number of individuals lack awareness of correct body posture, leading to the occurrence of lower back pain (Rahayu & Dayanti, 2021).

Based on the researchers' observations of seven inpatient nurses at a private hospital in Indonesia, it was noted that two nurses were observed working in an improper ergonomic position. The nurse seemed to flex her back while modifying the bed's height. During the infusion installation, three nurses failed to properly adjust the height of the bed, resulting in the nurse doing the task in a bent position. Additionally, one nurse lifted a patient whose body weight surpassed their own. Subsequent to completing the task, the nurse expressed discomfort in her waist while administering a massage to the afflicted region. When questioned about the ergonomic position, a nurse responded that

when lifting objects, one should squat. However, the nurse did not provide any additional clarification regarding whether the body position should be flexed or not.

Nurses should have acquired knowledge regarding ergonomic positions when engaging with patients, although there are still some nurses who, in reality, neglect to prioritise this aspect. The job conducted underwent a rigorous ergonomic risk evaluation (Kurniawidjaja, 2014). The researchers were interested in performing a study titled "The Correlation aming Level of Knowledge of Ergonomics and Low Back Pain Complaints in Inpatient Nurses" based on this backdrop.

METHOD

This study used a correlational quantitative design with a cross sectional approach. This research had passed ethical review from ethics committee of Faculty of Nursing Pelita Harapan University Number 062/KEPFON /I/2023. The respondents of this study were 158 nurses who served in the inpatient unit of a private hospital Indonesia. This study employed a total sampling technique. The research employed questionnaires that were both valid and trustworthy. The ergonomics knowledge questionnaire was devised by Bunga et al. (2019), whereas the questionnaire pertaining to low back pain complaints was prepared by Deria (2021). The process of gathering data and obtaining informed consent has been conducted through the utilisation of internet platforms such as Google Forms. The research was conducted over a period of two months, specifically from April 2023 to May 2023.

The data were subsequently subjected to univariate analysis in order to elucidate the frequency distribution of each variable. Bivariate analysis is conducted to examine the correlation between the independent factors (knowledge level regarding ergonomic posture) and the dependent variable (incidences of low back pain complaints). The test employed is the Chi-Square test.

RESULT

The research results are presented in the table 1-4. Based on the demographic information in Table 1, it was found that 145 respondents (91.8%) were female, and most respondents were in the early adult stage (26-35 years old) accounting for 102 respondents (64.6%). The work experience of most respondents was 0-5 years, namely 131 people (82.9%) and 103 respondents (65.2%) had normal BMI (18.5-22.9).

Table 1. Demographic Data Characteristics of Respondents (n=158)

Characteristics	Frequency (n)	Percentage (%)
Gender		
Male	13	8.2
Female	145	91.8
Age (year)		
17-25	9	5.7
26-35	102	64.6
36-45	41	25.9
46-55	6	3.8
Working Experience (year)		
0-5	131	82.9
6-10	7	4.4
11-15	9	5.6
16-20	7	4.4
21-25	4	2.5
26-30	1	0.6
>31	1	0.6
Body Mass Index		
< 18.5	24	15.2
18.5-22.9	103	65.2
23-24.9	19	12
25-29.9	11	7
> 30	1	0.6
Education History		
Diploma in Nursing	19	12
Bachelor in Nursing	44	27.8
Registered Nurse	89	56.3
Master in Nursing	6	3.8
History of Spine Disease		
No	97	61.4
Yes	61	38.6

The most common educational history was Registered Nurse, 89 respondents (56.3%). In addition, most of the respondents, 97 people (61.4%) did not have a history of spinal disease.

Table 2. Frequency Distribution of Level of Knowledge about Ergonomics Position in Nurses (n=158)

Level of Knowledge	Frequency (n)	Percentage (%)
Good	81	51.3
Enough	46	29.1
Less	31	19.6
Total	158	100

Based on table, it can be seen that 81 respondents (51.3%) have a good level of knowledge.

Table 3. Frequency Distribution of Low Back Pain Complaints (n=158)

LBP complaints	Frequency (n)	Percentage (%)
Low	81	51.3
Average	61	39.2
High	15	9.5
Total	158	100

Table 3 shows that 81 respondents (51.3%) had low back pain complaints, 62 respondents (39.2%) had average low back pain complaints, and 15 respondents (9.5%) had high low back pain complaints.

Table 4. Correlation Among Level of Knowledge of Ergonomics with Low Back Pain Complaints (n=158)

LBP Complaints	Knowledge Level						*p-value*
	Good	%	Enough	%	Less	%	
Low	34	21.5	30	19	17	10.8	
Average	36	22.8	14	8.9	12	7.6	0.105
High	11	7	2	1.3	2	1.3	

Pearson chi-square statistical test results showed p-value = 0.105 or $p \geq 0.05$ which indicated that there was no significant relationship between the level of knowledge

about ergonomics positions and complaints of low back pain in inpatient nurses.

DISCUSSION

Suwaryo & Yuwono (2017) stated that early adulthood is a period characterised by high levels of productivity. Pangesti (2012) asserted that individuals with strong cognitive ability tend to engage in intensive activities during their productive years. Based on the acquired results, the majority of nurses working in inpatient rooms belong to the age group of early adulthood, specifically between 26 and 35 years old (64.6%). An individual's age influences their mindset and comprehension.

Out of the total number of respondents, 145 individuals, accounting for 91.8%, were women. According to Fatoni and Saswati (2012), the likelihood of experiencing symptoms related to lower back pain (LBP) is equal for both males and females. Gender can impact the occurrence of low back pain, as it is more prevalent in women, particularly during the menstrual cycle. Decreased bone density, resulting from reduced oestrogen levels during menopause, can contribute to the occurrence of low back pain (Fatoni & Saswati, 2012).

The duration of employment is a factor that relates to the occurrence of lower back pain complaints among nurses. Out of the total number of respondents, 131 individuals, which accounts for 82.9% of the sample, had a work experience ranging from one year to less than five years. Umboh et al. (2017) found in their research, as cited by Noli et al. (2021), that individuals with more than five years of work experience are more prone to expressing a higher level of dissatisfaction about lower back pain (LBP). Therefore, it can be concluded that the responders are not at a substantial risk of developing low back pain (LBP).

Based on the univariate analysis, it was found that 81 respondents, accounting for 51.3% of the total, demonstrated a satisfactory level of knowledge on ergonomic positions. This sound knowledge is substantiated by the findings of demographic statistics, which indicate that 56.3% of nurses possess a high degree of education. Furthermore, 64.6% of nurses belong to the early adult demographic, which is characterised by being in a productive age range. Hence, a nurse's elevated degree of knowledge and strong cognitive capacities during early adulthood are determining variables in their ability to

comprehend ergonomic situations effectively.

According to the demographic data, 81 respondents, which accounts for 51.3% of the total, reported experiencing complaints of low back pain (LBP) in the low group. Meanwhile, individuals in the severe category expressed dissatisfaction, attributing it to excessive lordosis resulting from frequent bending, stretching, and twisting of the back during work. Severe lumbar lordosis results in the rearward protrusion of 16 intervertebral discs and the narrowing or compression of the canal, anatomically speaking. Low back pain, often known as LBP, is attributed to this factor (Ramdani, 2018).

The results of this study align with the research conducted by Astuti (2022), which yielded a non-significant connection (p = 0.574) between knowledge level and low back pain. Hendrasari et al. (2017) provide additional evidence for this research by examining the correlation between the level of expertise in ergonomics and habitual learning positions with the occurrence of low back pain in a sample of 60 respondents. The findings of this study indicated that there was no statistically significant correlation between the level of expertise in ergonomics and the occurrence of complaints related to low back pain, as evidenced by a p-value of 0.583 (p-value > 0.05).

Nevertheless, this research contradicts the findings of Dewi's (2017) study. The statistical test findings indicate a significant association between the amount of knowledge of nurses about ergonomic positions and the occurrence of low back pain in Tarakan General Hospital, as evidenced by a p-value of 0.001.

The findings of this study suggest that there is no correlation between the level of expertise and reports of low back pain in nurses who are hospitalised. This occurs because having strong information reduces the likelihood of getting low back discomfort. The acquisition of knowledge is derived from the processing and application of information in daily life, including professional activities (Astuti, 2022). Acquiring a proficient understanding of ergonomics will heighten the nurse's consciousness, enabling them to effectively use appropriate ergonomic principles in their work. Additionally, by using the ideal ergonomic position while working, the nurse can reduce the occurrence of lower back pain complaints.

The link between these two variables is not altered by the characteristics of the respondents, specifically their age and length of service. According to Andini (2015), there is a direct correlation between age and the likelihood of having LBP, with older individuals being at a greater risk. Nevertheless, the data reveals that among the older participants, just 3.8% were between the ages of 46 and 55, but 38.6% had previously experienced lower back pain. Similarly, according to Verawati (2016), an extended duration of employment might lead to nurses engaging in repetitive tasks, which may result in muscular discomfort. A total of 82.9% of nurses had a working experience ranging from 0 to 5 years, whereas 38.6% of the participants reported a previous occurrence of low back pain (LBP).

Overall, there are constraints arising in this research. Initially, it is important to note that this study exclusively focused on a single private hospital in Indonesia, so it cannot be considered as a comprehensive representation of all hospitals in the western part of Indonesia. In addition, there are only a limited number of research papers examining the extent of nurses' awareness about ergonomic positioning. Additionally, this study was conducted exclusively at a single hospital, limiting its ability to accurately reflect all hospitals in western Indonesia. This study solely employed a questionnaire as a research tool, without personally examining the operational dynamics of the nurses' positions.

CONCLUSION

The study using Pearson chi-square revealed that there was no statistically significant correlation between the level of knowledge of ergonomic positions and complaints of Low Back Pain among inpatient nurses. This was shown by a p-value of 0.105, which is greater than the significance level of 0.05. Furthermore, prospective researchers aiming to investigate the correlation between ergonomic posture and complaints of lower back pain (LBP) should be capable of exploring the causative aspects of LBP and performing studies with higher sample sizes, such as in intensive care units and emergency departments. The researchers also anticipate that future investigators will not only depend on a single hospital, but rather have the option to select other hospitals as research sites.

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