



## Analysis of Factors Affecting Complaints of Lower Back Pain among Nurses at Bhayangkara Hospital Kendari

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### ABSTRACT

**Background:** One of the important factors that affect the quality of nurses' work is occupational health and safety. One of the occupational diseases is Low Back Pain (LBP). Occupations that have a high risk of back pain are nurses. According to the Indonesian Neurological Association (INA) regarding the incidence of lower back pain in hospital nurses, the prevalence of lower back pain cases in nurses in Indonesia shows that 18,2% occurs in men and 13,6% in women. Then, based on the nursing management report at Bhayangkara Hospital Kendari in 2023, most of the nurses' complaints were lower back pain due to the workload being too high for nurses.

**Method:** This research was a quantitative analytical research with a cross-sectional design approach. The data analysis was carried out using SPSS statistical tests with multiple linear regression. The population in this study was 102 nurses, while the sample was 102 nurses (total sampling).

**Results:** The results showed a significant *p-value* for workload  $0,049 < 0,05$ , physical activity  $0,028 < 0,05$ , body position  $0,004 < 0,05$ , working period  $0,048 < 0,05$  and body mass index (BMI)  $0,001 < 0,05$ .

**Conclusion:** This research concluded that there was an effect between workload, physical activity, body position, work period and body mass index on complaints of lower back pain in nurses at Bhayangkara Hospital Tk.III Kendari. This research can be a reference material for hospitals, health workers or nurses and can increase knowledge in preventing or reducing the occurrence of lower back pain while working.

**KEYWORDS:** BMI, Body Position, Lower Back Pain, Physical Activity, Working Period, Workload.

### INTRODUCTION

One of the important factors that affect the quality of nurses' work is occupational health and safety. A poorly implemented occupational health and safety program can increase the risk of work-related illnesses and accidents.<sup>(1)</sup> Diseases caused by work equipment, processes, materials and the work environment are called occupational diseases. One of the occupational diseases is Low Back Pain (LBP).<sup>(2)</sup>

According to WHO, a study in Anggraika showed that 33% of people in developing countries experience persistent pain.<sup>(3)</sup> In 2017-2019, around 17,3 million people in the UK suffered from back pain. Of this number, around 1,1 million people become paralyzed as a result of back pain. 26% of American adults reported experiencing low back pain at least 1 day within a 3 month duration.<sup>(4)</sup>

The prevalence of lower back pain shows quite significant figures, both globally and in developing countries such as Indonesia. Globally, in 2019, around 15%-45% of the world's population experienced lower back pain. In developing countries, around 33% of the population experiences symptoms of lower back pain, while in developed countries, almost 70%-80% of the population experiences lower back pain.<sup>(5)</sup>

The results of Basic Health Research in 2018 showed that the national prevalence of musculoskeletal disorders diagnosed by health workers in Indonesia is 11,9%.<sup>(6)</sup> The number of sufferers of low back pain is predicted to be around 7,6%.<sup>(5)</sup> In particular, a study by the Indonesian Neurological Association (INA) regarding the incidence of lower back pain in nurses from the hospitals studied shows that 18.2% occur in men and 13,6% in women. The 40-year-olds are the age group that experiences the most lower back pain.<sup>(7)</sup>



Occupations that have a high risk of back pain are nurses. The prevalence of LBP in nurses throughout the world has not changed much over 12 years. Between 2008 and 2019, it was around 50%-70%, although various intervention studies have provided positive results—the incidence of low back pain among nurses in hospitals. In Sweden, RNH receives 87% of low back pain cases in 1,033 nurses.<sup>(8)</sup> Nurses carry out their work using many movements, such as bending, turning and lifting.<sup>(2)</sup>

Based on the nursing management report at Bhayangkara Kendari Hospital, most of the nurses' complaints were lower back pain due to the workload being too high on nurses, such as nurses on duty carrying out a lot of nursing activities both directly and indirectly. While on duty, the nurse must take the patient to the supporting examination room, take the patient to the inpatient room, take the patient to the operating room, take medicine, deliver laboratory test samples, push large oxygen cylinders, refer patients, and carry out quite a lot of and lengthy nursing documentation.<sup>(21)</sup>

Services can be of high quality if nurses do not experience health problems. On the other hand, services will be disrupted if a nurse has health problems, and one of the most frequent health problems is lower back pain. This is the basis for researchers interested in conducting research with the title "Analysis of Factors Affecting Complaints of Lower Back Pain among Nurses at Bhayangkara Hospital Tk.III Kendari in 2023".

**RESEARCH METHODS**

This research was a quantitative analytical research with a cross-sectional design approach. The population in this study was 102 nurses, while the sample was 102 nurses (total sampling). The research variables consisted of a dependent variable (low back pain complaints) and independent variables (workload, physical activity, body position, working period and body mass index). Based on the research objectives, the research used data types and data sources, namely primary data and secondary data. The data collection technique was through filling out a questionnaire, which was filled out via Google Forms. The data analysis was carried out using SPSS statistical tests with multiple linear regression. The data analysis used was univariate, bivariate and multivariate.

**RESULTS**

**Analysis of the Effect Between Workload and Low Back Pain Complaints**

**Table 1. Analysis of the Effect between Workload and Lower Back Pain Complaints at Bhayangkara Hospital Tk.III Kendari**

Variable	Correlation	Sig.	Results
Backpaincomplaints	0,521	<i>p</i> -value = 0,046 <i>p</i> < 0,05	Ho is rejected, Ha is accepted. Hypothesis proven.
Workload			

Based on Table 1 above, it shows that there is an effect between workload and lower back pain complaints. The results of the correlation test using the Pearson correlation test show that the correlation coefficient (*r*) is 0,521, and the significance value (*p*) is 0,046. Then, the significance (*p*) is smaller than the value of 0,05, which indicates that there is an influence between workload and lower back pain complaints.

**Analysis of the Effect Between Physical Activity and Low Back Pain Complaints**

**Table 2. Analysis of the Effect between Physical Activity and Lower Back Pain Complaints at Bhayangkara Hospital Tk.III Kendari**

Variable	Correlation	Sig.	Results
Backpaincomplaints	0,673	<i>p</i> -value = 0,032 <i>p</i> < 0,05	Ho is rejected, Ha is accepted. Hypothesis proven.
PhysicalActivity			

Based on Table 2 above, it shows that there is an effect between physical activity and lower back pain complaints. The results of the correlation test using the Pearson correlation test show that the correlation coefficient (*r*) is 0.673, and the significance



value ( $p$ ) is 0.032. Then, the significance ( $p$ ) is smaller than the value of 0.05, which states that there is an influence between physical activity and lower back pain complaints.

**Analysis of the Effect Between Body Position and Low Back Pain Complaints**

**Table 3. Analysis of the Effect between BodyPosition and LowerBack PainComplaints at Bhayangkara Hospital Tk.III Kendari**

Variable	Correlation	Sig.	Results
Backpaincomplaints	0,526	$p$ -value = 0,022, $p < 0,05$	Ho is rejected, Ha is accepted. Hypothesisproven.
Bodyposition			

Based on Table 3 above, it shows that there is an effect between body position and lower back pain complaints. The results of the correlation test using the Pearson correlation test show that the correlation coefficient ( $r$ ) is 0,526, and the significance value ( $p$ ) is 0,022. Then, the significance ( $p$ ) is smaller than the value of 0,05, which states that there is an influence between body position and lower back pain complaints.

**Analysis of the Effect Between Working Period and Low Back Pain Complaints**

**Table 4. Analysis of the Effect between WorkingPeriod and LowerBack PainComplaints at Bhayangkara Hospital Tk.III Kendari**

Variable	Correlation	Sig.	Results
Backpaincomplaints	0,486	$p$ -value = 0,045, $p < 0,05$	Ho is rejected, Ha is accepted. Hypothesisproven.
Working period			

Based on Table 4 above, it shows that there is an effect between work experience and lower back complaints pain. The results of the correlation test using the Pearson correlation test show that the correlation coefficient ( $r$ ) is 0,486, and the significance value ( $p$ ) is 0,045. Then, the significance ( $p$ ) is smaller than the value of 0,05, which states that there is an effect between working years and lower back pain complaints.

**Analysis of the Effect Between Body Mass Indexand Low Back Pain Complaints**

**Table 5. Analysis of the Effect between BodyMass Index and LowerBack PainComplaints at Bhayangkara Hospital Tk.III Kendari**

Variable	Correlation	Sig.	Results
Backpaincomplaints	0,498	$p$ -value = 0,046, $p < 0,05$	Ho is rejected, Ha is accepted. Hypothesisproven.
Bodymassindex			

Based on Table 5 above, it shows that there is an effect between body mass index and lower back pain complaints. The results of the correlation test using the Pearson correlation test show that the correlation coefficient ( $r$ ) is 0,498, and the significance value ( $p$ ) is 0,046. Then, significance ( $p$ ) is smaller than the value of 0,05, which states that there is an effect between body mass index and lower back pain complaints



**Table 6. Multiple LinearRegression Analysis of the Effect ofWorkload, PhysicalActivity, BodyPosition, WorkingPeriod and BodyMass Index on LowerBack Pain Complaints at Bhayangkara Hospital Tk.III Kendari**

Var. (X)	Var.(Y)	sig	R-Square	t-Test	F-Test	β
X1	Y	,049	0,553	0,681	2.618 Sig = 0,029	,258
X2		,028		1,072		2,095
X3		,004		1,947		1,116
X4		,048		,702		,311
X5		,001		1,792		1,972

Based on Table 6 above, it can be seen that the results for the independent variable workload have a significant value of  $0,049 < 0,05$ , with a t-count value of  $(0,681) < t\text{-table} (1,988)$ . The physical activity variable is  $0,028 < 0,05$ , with a t-count value  $(1,072) < t\text{-table} (1,988)$ . The working period variable has a significant value of  $0,048 < 0,05$ , with a t-count value of  $(0,702) < t\text{-table} (1,988)$ . The body mass index variable has a significant value of  $0,001 < 0,05$ , with a t-count value  $(1,972) < t\text{-table} (1,988)$ . Then, the results state that the independent variables (workload, physical activity, body position, working period and body mass index) have a significant effect on the dependent variable (low back pain complaints).

The simultaneous test results (F) have a significance value of  $0,029 < 0,05$  and an F-count  $(2,618 > \text{from F-table} (2,31))$ , which states that  $H_0$  is rejected and  $H_a$  is accepted. This means that the five independent variables (workload, physical activity, position body, working period and body mass index) together have a significant effect on the dependent variable (low back pain complaints).

Therefore, it can be concluded that this multiple regression model is suitable for use, and the independent variables, including workload, physical activity, body position, working period and body mass index, have a simultaneous influence on the dependent variable (low back pain complaints). The R-square value is  $0,553$ , meaning that the five independent variables can explain the lower back pain complaint variable by  $0,553 (55,3\%)$ , while the remaining  $44,7\%$  is explained by other variables outside of the variables studied.

**DISCUSSION**

**The Effect of Workload on Low Back Pain Complaints**

The results of the linear regression test show that there is an effect between workload and lower back pain in implementing nurses at Bhayangkara Hospital Tk.III Kendari ( $p\text{-value} = 0,049 < 0,05$ ). For nurses who complain of lower back pain, the majority is due to high workload (62,7%).

Workload is a physical, mental and social burden given to someone that must be completed within a certain time, depending on the physical abilities and limitations of the worker carrying the burden. Workload is the number of tasks that a person or group of people must complete in a certain time period under normal conditions.<sup>(9)</sup>

The results of this research are supported by a study conducted by (10) entitled "Factors Related to the Low Back Pain Complaints in Nurses in Inpatient and Surgical Rooms at the RAA Soewondo Pati Regional General Hospital" with a significant value of p-value  $0.000 (p < 0,05)$ , which means there is a significant relationship between workload and low back pain complaints in nurses at RAA Soewondo Pati Regional General Hospital. Nurses with heavy workloads have a risk of experiencing LBP 5,6 times greater than nurses with a moderate workload.

Then, the results of other research also support this, for example, a study conducted by (11) entitled "The Relationship between Operating Room Nurse Workload and the Incident of Low Back Pain in Operating Room Nurses at Yogyakarta City Hospital in 2019", with a significant p-value of  $0,038$ , which means there is a significant relationship between the workload of operating room nurses.

**The Effect of Physical Activity on Lower Back Pain Complaints**

The results of the linear regression test show that there is a relationship between physical activity and lower back pain complaints among nurses at Bhayangkara Hospital Tk.III Kendari ( $p\text{-value} = 0,028 < 0,05$ ). The nurses who experience the most complaints of lower back pain are nurses with moderate physical activity (63,7%).



Nursing is a job related to manual handling activities, such as pushing, lifting, holding, pulling, carrying or moving weights with the hands, and exerting the whole body using muscles, which can increase the risk of lower back pain. This situation is caused by manual handling activities, such as pushing, pulling, lifting and lowering in unergonomic body positions when working. Another factor that can increase the risk of complaints of lower back pain is the nurse's activity when pushing and holding the patient's bed or wheelchair, so the nurse requires quite a lot of energy.<sup>(12)</sup>

The results of this research support a study conducted by (13) entitled "The Relationship between Physical Activity and Lower Back Pain in Nurses at the LuwukBanggai Regional General Hospital". The results of the chi-square hypothesis test analysis with a confidence level of 95% ( $\alpha$  0,05) show a significant relationship between physical activity and low back pain, where the *p-value* is 0,001 ( $<0,05$ ). Thus, there is a relationship between physical activity and lower back pain in nurses at LuwukBanggai Regional General Hospital.

In addition, the results of another study conducted by (14) entitled "The Relationship of Nurse Position in Carrying Out Transfer Handling Patients to Nurses' Lower Back Pain Complaints at Reksa Waluya Hospital of Mojokerto", with a significant *p-value* of 0,000 ( $<0,05$ ) which means there is a relationship between the nurse's position in handling transfer bed patients and nurses' complaints of lower back pain. The nursing profession has high mobility because a nurse carries out activities such as lifting patients, moving patients manually, and taking care of all the patient's needs, coupled with physical activity outside working hours, such as exercising heavily and rarely resting in free time.

### The Effect of Body Position on Lower Back Pain Complaints

The results of the linear regression test show that there is a relationship between body position and lower back pain complaints among nurses at Bhayangkara Hospital Tk.III Kendari (*p-value*= 0,004  $<0,05$ ). Nurses who experience the most complaints of lower back pain are nurses with a body position when working at level 4 (99%), where corrective action is needed as soon as possible for this condition.

An ergonomic working position is a good working position. Ergonomics itself is the harmony between employees, work styles and the environment. Unergonomic work postures occur when nurses force their body positions, which causes muscle fatigue more quickly and can indirectly cause extra workload. The consequences that will arise if we do not adopt an ergonomic body position are tension in the muscles, as well as the appearance of pain in certain parts of the body.<sup>(12)</sup>

The results of this research are supported by a study conducted by (15) entitled "The Relationship between Characteristics and Work Attitudes with Low Back Pain Complaints in Nurses at the Petala Bumi Regional General Hospital, Riau Province in 2022". This research found that out of 46 respondents whose work attitudes are not ergonomic, 25 people (54,3%) experience complaints of low back pain. Meanwhile, of the 13 respondents regarding ergonomic work attitudes, there are 2 people (15,4%) who experienced complaints of low back pain, with a significant value of 0.030 ( $p<0,05$ ). Statistically, it can be concluded that there is a significant relationship between work attitude and low back pain complaints among nurses at the Petala Bumi Regional General Hospital, Riau Province, in 2022.

Sitting positions while working that are not ergonomic, such as not being upright and not leaning back, as well as bending forward, can cause low back pain. The ergonomic sitting position is to sit upright and lean back with our back straight and shoulders back. Our thighs rest on the seat of the chair, and our buttocks should touch the back of the chair. The spine has a shape that curves slightly forward at the waist, so a pillow can be placed to support the curvature of the spine.<sup>(12)</sup>

### The Effect of Working Period on Lower Back Pain Complaints

The results of the linear regression test show that there is a relationship between working period and lower back pain complaints among nurses at Bhayangkara Hospital Tk.III Kendari (*p-value* = 0,048  $<0,05$ ). For nurses who experience complaints of lower back pain, around 66,7% are nurses with new work experience ( $<6$  years). This is due to the work of nurses from the start of work; there is no difference in the work of nurses with long or medium working periods. Work period is the period or length of time a person works at an agency, office, and so on.<sup>(16)</sup>

The results of this research are in line with the research results of (3), which found that of the 54 respondents who have a long working period, there are 36 (66,7%). In addition, (17) investigated "The Relationship between Working Period and Working Load toward Low Back Pain Complaints in Nurses in the Inpatient Room at Bhayangkara Hospital Tk.III Manado" and found 21 respondents out of 42 respondents with a work period of  $<5$  years. If this activity is carried out continuously, it will cause disturbances in the body. Physical stress over a certain period of time results in reduced muscle performance, with symptoms of





reduced movement. Pressures will accumulate every day over a long period, resulting in worsening health, also known as clinical or chronic fatigue.<sup>(10)</sup>

The working period is one of the individual factors that influence the occurrence of lower back pain complaints.<sup>(12)</sup> Working period is a factor related to the length of time someone works in a place. In this regard, a study conducted at GMIM Pancaran Kasih Hospital Manado found that nurses with a working period of < 5 years experience complaints of lower back pain with a total of 8 people (15,1%), compared to nurses with a working period of  $\geq 5$  years old who experienced lower back pain were 38 people (71,7%). This research shows that there is a significant relationship between work experience and lower back pain complaints. The same research obtained by (18) showed that there is a relationship between working period and lower back pain complaints in nurses at Purbalingga Regional General Hospital.

### The Effect of Body Mass Index on Lower Back Pain Complaints

The results of the linear regression test show that there is an influence of body mass index on lower back pain complaints, with a *p-value* of 0,001 or  $p < 0,05$ . Nurses who complain of lower back pain are nurses with a normal body mass index (81,4%). This proves that with a normal body mass index, we will also experience complaints if we do not work by paying attention to occupational health and safety.

This research is in line with (19) that the results of the statistical tests carried out have a *p-value* (0,011) < 0,05, meaning that there is a relationship between the effect of BMI and LBP complaints. However, the results are different in a study conducted by (20) on inpatient nurses at X Hospital Kerinci. The statistical test results obtain a *p-value* = 0,132, meaning that the *p-value* is > 0,05, so the null hypothesis ( $H_0$ ) fails to be rejected. Therefore, it can be concluded that there is no significant relationship between BMI and low back pain complaints.

### CONCLUSION AND SUGGESTION

Based on the results of research on the analysis of factors affecting complaints of lower back pain among nurses at Bhayangkara Hospital Tk.III Kendari, it can be concluded that there is an influence between workload (0,029 < 0,05), physical activity (0,028 < 0,05), body position (0,004 < 0,05), working period (0,048 < 0,05), and index body mass (0,001 < 0,05) with complaints of lower back pain among nurses at Bhayangkara Hospital Tk.III Kendari in 2023. The variables that most influence complaints of low back pain among nurses at Bhayangkara Hospital Tk.III Kendari is physical activity with a beta value of 2,095, with a significance level of 0,028 < 0,05.

This research suggests that hospitals increase activities at Hospital Occupational Safety and Health (HOSH) to always carry out health checks on nurses at least every six months, provide HOSH rooms designated for storing files on nurses' health examination results, and provide service facilities for nurses who experience complaints of lower back pain that require Inpatient. Future researchers should look for other factors that cause complaints of lower back pain so that the title of this research can be more perfect.

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