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## **The Relationship Between Work Posture and Work Period with Musculoskeletal Disorders (MSDs) Complaints in Nurses in the Emergency Room (IGD) at Gambiran Hospital, Kediri City**

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### **ABSTRACT**

**Introduction:** Many patient care activities and carried out for a long duration of time can trigger nurses to not realize that every movement they make has the potential for incorrect or abnormal postures. Infusion installation and wound care activities that are not ergonomic, such as standing with your back bent and your neck statically bent for long periods of time, have the potential to cause complaints of Musculoskeletal Disorders (MSDs). The longer of working period, the higher of potential for experiencing Musculoskeletal Disorders (MSDs) complaints.

**Objective:** Determine the description of Musculoskeletal Disorders (MSDs) complaints, the relationship between work posture and Musculoskeletal Disorders (MSDs) complaints and the relationship between work experience and Musculoskeletal Disorders (MSDs) complaints.

**Method:** This type of research is quantitative with a total sampling technique. Data collection was carried out with the Nordic Body Map (NBM) questionnaire instruments and the Rapid Entire Body Assessment (REBA) form on 34 emergency room nurses at RSUD Gambiran Kota Kediri.

**Result:** the majority of nurses had a moderate level of work posture risk and have a long service life (> 6 years). The most common complaints experienced by nurses are in the right shoulder, back and waist. Based on the hypothesis test, working posture with complaints of Musculoskeletal Disorders (MSDs) was found to be (p-value 0.033) < 0.05 and work period with complaints of Musculoskeletal Disorders (MSDs) was obtained (p-value 0.048) < 0.05.

**Conclusion:** there is a significant relationship between work posture and complaints of Musculoskeletal Disorders (MSDs) and a significant relationship between work period and complaints of Musculoskeletal Disorders (MSDs).

**Keywords:** Musculoskeletal Disorders (MSDs); Occupational Safety and Health; Work Period; Work Posture

## INTRODUCTION

MSDs (Musculoskeletal Disorders) are complaints of muscles, joints, ligaments, and other skeletal systems due to abnormal or improper positions that are carried out for a long time. According to Tarwaka, MSDs (Musculoskeletal Disorders) are complaints of skeletal muscles starting from very light complaints to very painful complaints (1). MSDs are part of the occupational diseases with a high frequency of occurrence in health workers, such as nurses, because most of their work is physically demanding (2).

Musculoskeletal Disorders (MSDs) cases reported by the Survey of Occupational Injuries and Illnesses (SOII) in the US in 2018 have reached 900,380 cases, where the health and social assistance sector contributes 56,300 cases (3). An analysis of MSDs was also carried out by the Global Burden of Disease in 2019 with the result that 1.7 billion people in the world have suffered from MSDs in such form as low back pain, neck pain, fractures, other injuries, osteoarthritis, amputations, and rheumatoid arthritis (World Health Organization, 2022) (4). Based on a study by the Ministry of Health in Indonesia in 2012 in 12 districts or cities of 9,482 workers indicated that 16% of workers suffered from musculoskeletal, 8% of workers suffered from cardiovascular, 6% of workers suffered from nervous disorders, 3% of workers suffered from respiratory disorders, and 1.5% of workers suffered from ENT (5). According to RISKESDAS data in 2018, there were 7.9% diagnosed cases of MSDs in health workers (6).

Emergency room nurses have a high risk of MSDs complaints because most of their work activities are physically demanding with repetitive standing and walking for a long duration of time (7). These activities, especially when carrying out patient care such as lifting patients, pushing wheelchairs or patient beds, wound care, injecting, installing IVs, and others, will trigger MSDs. These activities, if not carried out according to procedures, can increase the occurrence of abnormal body postures, which have the potential to cause MSDs disorders in nurses (8).

MSDs complaints are mostly caused by repetitive activities with moderate weight that cause muscles contraction more than the optimum muscle strength (9). WHO mentioned that MSDs can be caused by individual, work, and psychosocial factors (10). Another triggering factor for MSDs complaints is the working period because the nurse's longer working period will increase MSDs complaints (11).

Based on the results of interviews and observations during Field Work Practices at Gambiran Hospital, Kediri City on May 6, 2023 to May 22, 2023, the researcher has collected data that there are 6 out of 8 nurses in the activities of infusion and wound care complaining of MSDs, especially in the legs and back. Infusion and wound care activities are the most dominant activities undertaken during patient care. In addition, the work posture in these activities is static for a long time with a bent back and bent neck.

Based on the facts described above, this study aims to determine the relationship of work posture and work period to complaints of Musculoskeletal Disorders (MSDs) in nurses at the Emergency Department (IGD) of Gambiran Hospital, Kediri City.

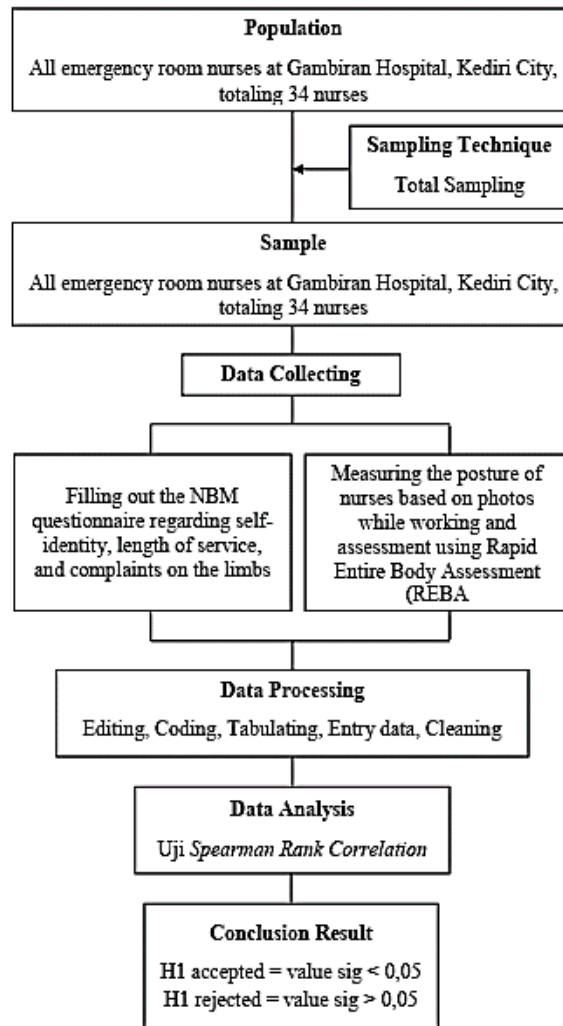
## METHOD

This study is quantitative research with cross sectional design. The research was conducted on emergency room nurses at Gambiran Hospital, Kediri City in 2023. The subjects of this study were all emergency room nurses at Gambiran Hospital, Kediri City, totaling 34 people. The sampling technique in this research is total sampling. Data collection was completed by using Nordic Body Map (NBM) questionnaire form and Rapid Entire Body Assessment (REBA) form.

The dependent variable in this research is Musculoskeletal Disorders (MSDs) complaints. Data on Musculoskeletal Disorders (MSDs) complaints were collected using the Nordic Body Map (NBM) questionnaire. Categories of MSDs complaints are categorized into 1). Score 28 - 49: No complaints, 2). Score 50 - 70: Mild complaints, 3). Score 71 - 9: Moderate Complaints; 4). Score 92 - 112: Severe Complaints (12).

The independent variables in this research are work period and work posture. Data on working period were collected using the Nordic Body Map (NBM) questionnaire form. According to M. A. Tulus, the working period is categorized into 2 categories, which are 1). New work period:  $\leq$  6 years, 2). Long work period:  $>$  6 years [13]. Work posture data is collected using the Rapid Entire Body Assessment (REBA) form. Categories of work postures according to Hignett and Mcatamney based on the level of risk are 1). Score 1: Very low, 2). Score 2 - 3: Low, 3). Score 4 - 7: Medium, 4). Score 8-10: High, 5). Score 11-15: Very high [14]. Data analysis in this research uses descriptive and inferential analysis using the Shapiro Wilk data normality test and hypothesis testing using the Spearman Rank Correlation test. Independent variables are said to be related if the p-value  $<$  0.05.

This research has received a certificate from the Health Research Ethics Commission of the Health Polytechnic of the Ministry of Health Malang with No. HK.02.03/F.XXI.31/1151/2023.



Page 1. Operational Framework

RESULTS

Sample Characteristics

Table 1. Frequency Distribution of Sample Characteristics

Variable	Emergency Room Nurse	
	Frequency	Percentage
<b>Gender</b>		
Male	8	23,5%
Female	26	76,5%
Total	34	100%
<b>Age</b>		
≤ 30 years	7	20,6%
> 30 years	27	79,4%
Total	34	100%

The table above shows the amount and percentage of respondent characteristics based on gender, namely 8 male nurses (23.5%) and 26 female nurses (76.5%). It means that the majority of emergency room nurses at Gambiran Hospital, Kediri City are female and have the potential to experience MSDs complaints. The amount and percentage based on age is < 30 years, 7 nurses (20.6%) and age > 30 years, 27 nurses (79.4%). The average age of emergency room nurses is 35 years. It means that the majority of emergency room nurses at Gambiran Hospital, Kediri City are more than 30 years old and potentially have decreased muscle strength.

## Work Posture Assessment

**Table 2.** Assessment of Emergency Room Nurses' Work Posture

Level Risk	Emergency Room Nurse	
	Frequency	Percentage
Low	6	17,6%
Moderate	26	76,5%
High	2	5,9%
Total	34	100%

The table above shows the amount and percentage of risk levels of nurses work postures, namely low work postures felt by 6 nurses (17.6%), moderate work postures felt by 26 nurses (76.5%), and high work postures in 2 nurses (5.9%). It means that emergency room nurses at Gambiran Hospital in Kediri have potentially hazardous work postures that need corrective action and examination. The following are the results of the calculation of work postures in IV insertion and wound care activities.

**Table 3.** Work Posture Assessment Based on Activity

Level Risk	IV insertion	
	Frequency	Percentage
Moderate	15	88,2%
High	2	11,8%

Level Risk	Wound Care	
	Frequency	Percentage
Low	6	35,3%
Moderate	11	64,7%

The table above shows the amount and percentage of the risk level of nurses work posture based on their work activities, namely infusion installation activities, moderate risk felt by 15 nurses (88.2%) and high risk felt by 2 nurses (11.8%) and low risk wound care activities felt by 6 nurses (35.3%) and moderate risk felt by 11 nurses (64.7%).

## Work Period Assessment

**Table 4.** Assessment of Working Period of Emergency Nurses

Work Period	Emergency Room Nurse	
	Frequency	Percentage
New ( $\leq 6$ years)	7	20,6%
Old ( $> 6$ years)	27	79,4%
Total	34	100%

The table above shows the amount and percentage of nurses work period, namely the new work period of 7 nurses (20.6%) and the old work period of 27 nurses (79.4%). It means IGD nurses have a working period of 9.5 years with a range of 1-18 years.

## Assessment of Musculoskeletal Disorders

**Table 5.** Assessment of MSDs Complaints in Emergency Room Nurses

Complaints	Emergency Room Nurse	
	Frequency	Percentage
Low Complaints	25	73,5%
Moderate Complaints	6	17,6%
High Complaints	3	8,8%
Total	34	100%

Based on the table above, it can be concluded that low complaints in 25 nurses (73.5%), moderate complaints in 6 nurses (17.6%), and high complaints in 3 nurses (8.8%). Most complaints were felt by nurses in 3 parts of the body, such as the right shoulder moderately painful (29.4%); painful (4%); very painful (5.9%), back moderately painful (20.6%); painful (26.5%), very painful (2.9%); and waist moderately painful (26.5%), painful (23.5%), very painful (5.9%).

### Results of Relationship Test Between Variables

**Table 6.** Recapitulation of Relationship Test Results

Variable	Correlation Coefficient	p value
Work Posture with Musculoskeletal Disorders	0,367	0,033*
Working Period with Musculoskeletal Disorders	0,342	0,048*

\*: Spearman Rank Correlation Test Results

Based on statistical tests of work posture with MSDs complaints, the results showed Asymp.Sig. (2-tailed) 0.033 < 0.05, which means that there is a significant relationship between work posture and complaints of Musculoskeletal Disorders in emergency room nurses at Gambiran Hospital, Kediri City. The correlation coefficient value of 0.367 means that the correlation is sufficient. Based on statistical tests of work posture with MSDs complaints, the results showed Asymp.Sig. (2-tailed) 0.0048 < 0.05, which means that there is a significant relationship between work period and complaints of Musculoskeletal Disorders in emergency room nurses at Gambiran Hospital, Kediri City. The correlation coefficient value of 0.342 means that the correlation is sufficient.

### DISCUSSION

The characteristics of respondents based on the recapitulation show that the majority of emergency room nurses at Gambiran Hospital, Kediri City are female and have the potential to experience MSDs complaints. In addition, the majority of emergency room nurses at Gambiran Hospital Kediri City are more than 30 years old and have the potential to experience decreased muscle strength.

The results of the assessment of MSDs complaints on the body parts of the emergency room nurses at Gambiran Hospital, Kediri City showed that the most complaints were felt by nurses in 3 (three) body parts, such as the right shoulder, back, and waist. Based on the results of observations and previous research, complaints on the right shoulder were obtained due to the work posture of nurses statically bending for a long period of time during infusion and wound care. The complaints on the back are caused by work postures that are bent almost 30° statically during the process of infusion and wound care. And complaints at the waist are caused by static bending work postures for a long time, lifting or moving patients, and decreased muscle strength and elasticity in terms of age. Based on interviews with emergency room nurses, most nurses with a long working period (> 6 years) are nurses who have worked as emergency room nurses from the beginning, while nurses with a new working period (≤ 6 years) are young nurses with a working period in the emergency room of less than 1 year.

This research is in line with Dahlia Purba, et.al (2020), namely regarding the relationship between work position and MSDs disorders in nurses with a sig value.  $0.045 < \alpha (0.05)$  which means that there is a significant relationship between position and MSDs in nurses, this relationship is reinforced by the correlation coefficient value of 0.319 which is categorized as low (15). Also, in line with research of Sulasmi, N.P.Q., et.al (2020), namely regarding the relationship between working period and MSDs disorders in nurses with a significant value of  $0.031 < \alpha (0.05)$  which means that there is a significant relationship between working period and MSDs disorders in nurses (16). Abnormal and static work postures for a long period of time can cause pain in several parts of the body's muscles so that it can reduce the functional ability of the muscles. This can affect comfort and quickly cause fatigue while working (17). The long working period, the potential for exposure to occupational diseases will be higher. Therefore, the longer a person's working period, the more a person is exposed to various factors that cause MSDs complaints (18).

In relation to the results of the study, the recommendations for improvement given to minimize the occurrence of MSDs complaints are: 1) Engineering: adjusting the height of the patient gurney according to the comfort and work performed by the nurse and routine maintenance can be carried out on the patient gurney, especially on the levers. 2) Administration: providing education related to ergonomic work postures to nurses in the form of posters, socialization, and others. As well as stretching between working hours or before work activities or before working hours begin to prevent MSDs complaints.

## CONCLUSION

Based on the results of the research "The Relationship between Work Posture and Work Period with Musculoskeletal Disorders (MSDs) Complaints in Emergency Room Nurses (IGD) at Gambiran Hospital, Kediri City" it was concluded that the characteristics of respondents in this study were age, gender, and length of service. The average age of emergency room nurses is 35 years with a percentage of age < 30 years (20.6%) and age > 30 years (79.4%). The gender of the majority of emergency room nurses is female (76.5%). The working period of the majority of emergency room nurses is a long working period (> 6 years). Activities in the emergency room nurses studied were IV insertion and wound care activities. These activities have dangerous work postures and moderate risk levels, with actions that need to be taken, namely repairs and examinations. Most MSDs complaints felt by 34 emergency room nurses were experienced in the right shoulder (39.3%), back (50%), and waist (55.9%). There is a significant relationship between work posture and length of service with complaints of Musculoskeletal Disorders in emergency room nurses at Gambiran Hospital, Kediri City.

## SUGGESTION

Suggestions that can be given to Gambiran Hospital, Kediri City, namely hospital management should pay attention to good and ergonomic work postures for emergency room nurses by making an independent stretching exercise guide, socialization related to good ergonomic work postures, and delivery of information through posters and pamphlets related to ergonomic work postures. Suggestions for emergency room nurses are to stretch in between working hours for about 5 minutes or before work activities or before working hours begin. And it is advisable to maintain a healthy lifestyle, exercise diligently, and eat nutritious foods. For future researchers, it is hoped that they can examine other factors that cause Musculoskeletal Disorders (MSDs) complaints and add height measurements to the Nordic Body Map (NBM) instrument to get the Body Mass Index (BMI).

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