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The Relationship Between Work Posture And Repetitive Movements With Musculoskeletal Disorders (MSDs) Among Management Department Employees At Prof. Dr. H. M. Chatib Quzwain Regional General Hospital, Sarolangun

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Abstract

Musculoskeletal Disorders (MSDs) are musculoskeletal system disorders affecting muscles, joints, tendons, and supporting tissues that may arise due to non-ergonomic working postures and repetitive occupational activities. Hospital management employees are considered a high-risk group for MSDs because their work predominantly involves prolonged sitting and extensive computer use. This study was conducted to examine the association between work posture and repetitive movements with the occurrence of Musculoskeletal Disorders (MSDs) among management employees at Prof. Dr. H.M. Chatib Quzwain Regional Hospital, Sarolangun. An analytical observational study with a cross-sectional design was employed. The study involved 31 respondents selected through purposive sampling. Data were obtained using the Nordic Body Map (NBM) questionnaire to identify MSD complaints, the Rapid Upper Limb Assessment (RULA) method to evaluate work posture, and direct observation to assess repetitive work activities. Data analysis was carried out using univariate and bivariate techniques with the Chi-Square test at a 95% confidence level. The findings revealed that 58.1% of respondents experienced moderate MSD complaints, 80.6% demonstrated high-risk work postures, and 54.8% engaged in repetitive work activities categorized as risky. The bivariate analysis showed that work posture was not significantly related to MSD occurrence (p = 0.656), whereas repetitive movements had a significant association with MSDs (p = 0.022). These findings indicate that repetitive work activities play a more substantial role in the development of MSDs than work posture among hospital management employees. Therefore, the implementation of ergonomic workplace practices and adequate rest periods is recommended to minimize the risk of MSDs.

Keywords: Ergonomics, Musculoskeletal Disorders, Repetitive Movemen, Work Posture, Workplace Health.

INTRODUCTION

Musculoskeletal Disorders (MSDs) are disorders of the musculoskeletal system that develop gradually. This condition usually begins with mild discomfort and can progress into more serious complaints if exposure to risk factors continues continuously (Rahmah & Herbawani, 2022). Continuous muscle contractions without movement variation have the potential to cause injuries to the body's supporting tissues, including tendons, ligaments, and joints. The occurrence of musculoskeletal disorders among workers is influenced by various risk factors, including biomechanical factors such as workload, body posture, duration, and frequency of work, as well as individual factors such as gender, age, length of service, and body mass index. According to World Health Organization (WHO) Pratiwi & G, (2026), MSDs are a major cause of disability worldwide and significantly contribute to loss of work productivity with a global prevalence ranging from 20% to 33%.

The main cause of MSD complaints among office workers is non-ergonomic body posture while performing work activities. Static positions, such as sitting continuously for a long period of time, will cause disruption of the supply of nutrients and oxygen to the muscles, hinder metabolic processes, and trigger compression of the spinal discs (Aprianto et al., 2021). In addition, repetition (repetitive) or movement activities performed repeatedly without variations in other movements can overstimulate the nerves and trigger cumulative pressure on tendon tissues without a strong stretching phase.

The utilization of digital technology in hospital administrative systems causes most management work to focus on computer use, making work activities tend to be sedentary and involve minimal physical movement. Most working hours are spent in a sitting position with intensive

computer use for financial data processing activities, management of medical record archives, and various other administrative tasks (Luh et al., 2023). This physical exposure, if occurring chronically on a daily to monthly basis, can trigger repetitive strain injuries such as carpal tunnel syndrome or tendinitis (Tunang et al., 2022).

Based on a preliminary survey conducted among management employees at RSUD Prof. Dr. H. M. Chatib Quzwain Sarolangun, it was found that 71.4% of employees worked in a static sitting position for 7–8 hours per day in front of a computer and rarely performed muscle stretching activities (stretching). A total of 57.1% operated computers without regular rest breaks, and 42.9% worked with a bent neck position or a hunched back due to computer screens that were not aligned with eye level. The most commonly reported subjective complaints included neck pain (42.9%), lower back pain (57.1%), shoulder pain (42.9%), and tingling in the wrists (42.9%). Based on the conditions found in the field, this study was conducted to determine and analyze the relationship between work posture and repetitive movements with the occurrence of Musculoskeletal Disorders (MSDs) complaints among management department employees at RSUD Prof. Dr. H. M. Chatib Quzwain Sarolangun.

RESEARCH METHODS

This study used a quantitative research method with an analytical observational design using a cross-sectional approach. The study was conducted in the administrative office environment of RSUD Prof. Dr. H. M. Chatib Quzwain Sarolangun, Jambi Province. The study population included all permanent employees in the hospital management department, totaling 40 people. The research sample was selected using a purposive sampling technique by considering inclusion criteria (minimum working period of 1 year, actively working in front of a computer, and willing to fully participate), resulting in a representative sample of 31 respondents.

The dependent variable of this study was the incidence of MSDs complaints, which was measured subjectively using the standardized Nordic Body Map (NBM) questionnaire. The complaint scores were classified into two categories: Low Risk (score 28–49) and Moderate Risk (score 50–70). The independent variables consisted of work posture and repetitive movements. Work posture was measured directly and objectively using the Rapid Upper Limb Assessment (RULA) assessment sheet through the measurement of body joint angles (neck, back, arms, and wrists) using a protractor, then categorized into Low Risk (score < 5) and High Risk (score ≥ 5). The repetitive variable was measured through observation of the frequency of repetitive movements per minute in the dominant hand during typing/mouse use, with the criteria of Not at Risk (< 11 movements/minute) and At Risk (≥ 11 movements/minute) (Fadhila Agung Farahdhiya & Ekawati, 2020). Quantitative data processing was carried out through the stages of editing, coding, entry, and cleaning. Data analysis included univariate analysis using frequency distribution tables and bivariate analysis using Chi-Square and Fisher Exact Test statistical tests at a 95% confidence level ($\alpha = 0.05$) with the assistance of statistical computer software.

RESULTS AND DISCUSSION

Respondent Characteristics

Based on the results of data collection from 31 respondents, it showed that the majority of workers were female (54.8%) and were dominated by the young age group under 22 years old (51.6%). Based on educational background, most respondents had a master's degree or S2 (58.1%). The workload characteristics showed that 64.5% of workers had a working period of more than 5 years, 54.8% worked more than 8 hours per day, and were dominated by a sitting posture (54.8%) while working in front of a computer for more than 6 hours per day (58.1%). Additional findings showed that 58.1% of respondents had received training related to occupational health and safety (OHS) and ergonomics.

Table 1. Demographic Characteristics and Work Profile of Respondents

Variable	Category	Frequency (n)	Percentage (%)
Gender	Female	17	54.8
	Male	14	45.2
Respondent Age	< 22 years old	16	51.6
	> 22 years old	15	48.2
Education Level	Diploma (D3)	4	12.9
	Bachelor's Degree (S1)	9	29.0
	Master's Degree (S2)	18	58.1
Length of Employment	< 5 years	11	35.5
	> 5 years	20	64.5
Working Hours per Day	< 8 hours	14	45.2
	> 8 hours	17	54.8
Dominant Working Position	Sitting	17	54.8
	Standing / Dynamic	14	45.2
Duration of Computer Use	< 6 hours	13	41.9
	> 6 hours	18	58.1
OHS Ergonomic Training	Ever attended	18	58.1
	Never attended	13	41.9

Univariate Analysis

Univariate analysis was used to determine the percentage distribution of the frequency of each research variable (the incidence of MSDs complaints, work posture risk level, and movement repetition level) individually, which is summarized in Table 2.

Table 2. Results of Univariate Analysis of Research Variables

Research Variable	Category	Frequency (n)	Percentage (%)
Musculoskeletal Disorders Complaints	Low Risk (score 28–49)	13	41.9
	Moderate Risk (score 50–70)	18	58.1
Work Posture Risk Level	Low Risk (RULA < 5)	6	19.4
	High Risk (RULA ≥ 5)	25	80.6
Movement Repetition Intensity	Not at Risk (< 11 movements/minute)	14	45.2
	At Risk (≥ 11 movements/minute)	17	54.8
Total Sample		31	100%

Based on Table 2, it can be identified that most employees in the management department of RSUD Sarolangun experienced MSDs complaints at a moderate risk level, namely 18 people (58.1%). In the work posture variable, a concerning condition was found where the majority of employees (80.6%) worked with body postures classified as high risk (RULA score ≥ 5), which means that their workstations require immediate corrective action. Meanwhile, for the hand movement repetition variable, more than half of the respondents (54.8%) were in the category of risky repetitive movements (≥ 11 movements per minute).

Bivariate Analysis

Bivariate analysis was applied to determine whether there was a statistically significant correlational relationship between the independent variables (work posture and repetition) and the dependent variable (the incidence of MSDs) using the Chi-Square test ($\alpha = 0.05$), as summarized in Table 3.

Table 3. Results of Independent Bivariate Association Test on MSDs

Variable	Moderate MSDs n (%)	Low MSDs n (%)	Total n (%)	PR (95% CI)	p-value
Work Posture				1.250 (0.492–3.178)	0.656
High Risk	15 (60.0)	10 (40.0)	25 (100.0)		
Low Risk	3 (50.0)	3 (50.0)	6 (100.0)		
Work Repetition				2.732 (1.065–7.006)	0.022
At Risk	13 (76.5)	4 (23.5)	17 (100.0)		
Not at Risk	5 (35.7)	9 (64.3)	14 (100.0)		

Relationship Between Work Posture and the Incidence of MSDs

Based on the bivariate test results presented in Table 3, the Pearson Chi-Square test produced a significance value of p-value 0.656 ($p > 0.05$), which was confirmed by the Fisher Exact Test value of 0.676 ($p > 0.05$). Although the proportion of respondents with poor RULA posture was quite high (80.6%), this did not linearly worsen MSD symptoms. This condition can be explained by the nature of administrative work that still allows variations in dynamic movements; workers do not only sit still but also stand or walk to retrieve documents, which provides a break for static muscles to relax. In addition, the majority of employees having a working period of more than 5 years allows the occurrence of tolerance and body adaptation to routine work patterns. Good understanding of OHS among staff also helps them modify their sitting positions despite the lack of ideal facilities. Statistically, this proves that there is no significant relationship between work posture and the incidence of Musculoskeletal Disorders (MSDs) among management department employees at RSUD Prof. Dr. H. M. Chatib Quzwain Sarolangun.

Relationship Between Movement Repetition and the Incidence of MSDs

The results of the bivariate test in Table 3 showed that the movement repetition variable produced a Pearson Chi-Square value of 5.237 with a significance p-value of 0.022 ($p < 0.05$), supported by a significant Fisher Exact Test value of 0.033 ($p < 0.05$). Based on the principles of statistical conclusion, the null hypothesis was rejected, which means that there is a meaningful and significant relationship between movement repetition and the incidence of Musculoskeletal Disorders (MSDs) among management department employees at RSUD Prof. Dr. H. M. Chatib Quzwain Sarolangun.

This analytical result reinforces the principle of work physiology stating that local muscle contraction force exerted at a high repetitive frequency (≥ 11 movements per minute) without adequate recovery time will trigger local ischemia in tendon tissues. Activities such as typing reports, entering financial data monotonously, and positioning fingers repeatedly on a computer mouse cause accumulated microtrauma in the wrist tendon structures (flexor digitorum), forearms, and trapezius muscle area in the shoulders. This repetitive dynamic workload disrupts the smooth circulation of capillary blood, resulting in muscle tissue hypoxia and triggering massive accumulation of lactic acid within muscle cells. This accumulation of lactic acid stimulates sensory pain nerve endings, manifesting as chronic soreness, stiffness, and tingling experienced by 58.1% of employees in the moderate-risk MSDs complaint category (Wildasari & Nurcahyo, 2023).

CONCLUSIONS

Based on the results of the analysis and discussion of this study, it can be concluded that work posture does not have a significant relationship with the incidence of Musculoskeletal Disorders (MSDs) among management department employees at RSUD Prof. Dr. H. M. Chatib Quzwain Sarolangun, as indicated by the value (p = 0.656). In contrast, there is a significant and strong relationship between the intensity of repetitive movements and the incidence of MSDs complaints among this group of employees (p = 0.022). Musculoskeletal disorder complaints were dominated by a moderate risk level (58.1%), which was strongly influenced by exposure to repetitive monotonous movements while operating office computer devices.

To minimize the risk of musculoskeletal disorders among management employees, it is recommended that the authorities of RSUD Sarolangun implement regular office Occupational Health and Safety (OHS) programs. Hospital management is advised to establish a structured short-break policy, such as requiring employees to perform brief muscle stretching activities (ice breaking/stretching) for 2–5 minutes between computer working hours every 2 hours to interrupt repetitive tension. In addition, ergonomic redesign of workstations (adjustment of chair and desk height) and variation in daily operational task rotation are necessary to reduce the duration of monotonous work. For future researchers, it is recommended to develop objective medical methods for measuring MSDs complaints and to expand the scope of research by analyzing psychosocial work variables and workers' physical fitness levels.

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