ANALYSIS OF BODY POSTURE, ENVIRONMENT AND WORKLOAD ON NECK AND SHOULDER PAIN COMPLAINTS IN NURSES AT CENDRAWASIH DOBO REGIONAL HOSPITAL

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ABSTRACT

Nurses in hospitals often face work challenges such as non-ergonomic posture, less than ideal work environment, and heavy workload, which can trigger neck and shoulder pain complaints. This problem not only affects the health and productivity of nurses, but can also affect the quality of health services provided to patients. This study was conducted to analyze the relationship between posture, environment, and workload on neck and shoulder pain complaints in nurses at Cendrawasih Dobo Hospital, in order to provide recommendations for improving more ergonomic working conditions. This study used an observational design with a cross-sectional approach to analyze the relationship between posture, environment, and workload on neck and shoulder pain complaints in nurses at Cendrawasih Dobo Hospital. The REBA method was used to evaluate ergonomic risks, with data collection through questionnaires analyzed using univariate, bivariate, and multivariate analysis. The study was conducted in September-October 2024 with a total sampling technique on the entire population of 140 nurses in the hospital. The results showed that there was a significant relationship between body posture (p-value 0.000, correlation 0.538) and workload (p-value 0.000, correlation 0.442) with neck and shoulder pain complaints, where the worse the body posture and the heavier the workload, the higher the pain complaints. In addition, a non-standard work environment, such as low lighting (52-348 lux) and high noise (> 45 dB), also increased the risk of these complaints. These findings emphasize the importance of improving ergonomics and work environment conditions to improve the health and well-being of nurses.

KEYWORDS	*Workload, Environment, Neck and Shoulder, Body Posture,*

INTRODUCTION

Hospitals are a health service industry, and are also capital-intensive, technology-intensive, and human resource-intensive institutions whose processes contain many potential hazards such as the dangers of radiation exposure, toxic chemicals, extreme temperatures, ergonomics, and so on, which can affect workers if not handled properly and correctly, can have a negative impact on the safety and health of workers.(Iwani, 2020).

The nursing profession is associated with various body postures and work attitudes. The work postures that are often done are standing, sitting and bending postures. The work posture is adjusted to the conditions of the work system required. Such as when moving patients, pushing stretchers and lifting patients. Inappropriate and unusual or awkward work postures can potentially cause the risk of musculoskeletal injury(Arifah et al., 2019).

*Musculoskeletal Disorders*is a condition in which part of the muscle and bone system experiences disorders or pain(Suriya et al., 2019). According to the World Health Organization (WHO) in 2021, it explains that around 1.71 billion people worldwide experience musculoskeletal conditions, while the prevalence of musculoskeletal conditions varies by age and diagnosis, all ages worldwide are affected. High-income countries are the most affected with 441 million people, followed by countries in the WHO Western Pacific Region with 427 million and the South-East Asia Region with 369 million. Musculoskeletal conditions are also the largest contributor to years lived with disability (YLDs) worldwide with around 149 million YLDS, accounting for 17% of all YLDs worldwide. Low back pain is a major contributor to the overall burden of musculoskeletal conditions. Other contributors to the overall burden of musculoskeletal conditions include fractures with 436 million people worldwide, osteoarthritis (343 million), other injuries (305 million), neck pain (222 million), amputations (175 million) and rheumatoid arthritis (14 million)(WHO, 2022).

Then based on data from The Sixth European Working Conditions Survey in 2020, the main work-related health problems affecting workers in the workplace are MSDs. In addition, almost half of European workers suffer from MSDs. In the EU, back pain is a health problem, followed by neck and upper limb pain. 43% of workers reported back pain and 41% muscle pain in the shoulders, neck and upper or lower limbs. Variability among self-reported back pain rates by EU member states with high results, ranging from 79% in Finland to 40% in Hungary(L. Nunes I., 2020).

According to RISKESDAS in 2018, the number of MSDs cases based on health worker diagnosis was 7.9%. Based on a report from the Maluku Health Office, the prevalence of Musculoskeletal Disorders (MSDs) in Maluku Province showed an increase from 854 cases in 2017 to 1,276 cases in 2018, and reached 2,827 cases in 2019. The prevalence of Musculoskeletal Disorders in Aru Islands Regency showed fluctuations with 77 cases in 2017, increasing to 93 cases in 2018, reaching a peak of 197 cases in 2019 (Maluku Health Office, 2019).

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Research conducted by(Helmina, et al., 2019)also had time to conduct interviews using instruments and it was found that nurses stated that there were complaints of pain in the neck, shoulder pain, upper back pain and lower back pain. Nurses also stated that these complaints had never been felt before, they arose suddenly and these complaints appeared and disappeared after being taken to rest. In this preliminary study it was also found that all ages of nurses were at risk of experiencing musculoskeletal disorders, gender in both men and women both stated complaints, the length of service of nurses also varied between the length of service and new nurses, while the exercise habits of nurses also stated that they had experienced MSDs complaints.

The novelty of this study lies in the holistic analysis that integrates three main factors, namely body posture, work environment, and workload, which simultaneously affect neck and shoulder pain complaints in nurses at Cendrawasih Dobo Regional Hospital. This approach has not been studied specifically in the context of hospitals in remote areas, which have unique challenges related to working conditions and resources. This study aims to identify the relationship between these three factors and musculoskeletal complaints, especially in the neck and shoulder area, in order to provide evidence-based recommendations to improve work ergonomics, reduce the risk of injury, and improve the well-being and productivity of nurses.

RESEARCH METHOD

The method used is an observational method. The research design used in this study is observational with a cross-sectional approach to describe the conditions that are or have occurred, and then analyze them using the REBA (Rapid Entire Body Assessment) method. This method uses data in the form of numbers as a tool to analyze and conduct research studies. This research was conducted from September to October 2024. This research was aimed at nurses at the Cendrawasih Dobo Regional General Hospital on Jl. Cendrawasih No.Km.6, Siwalima, Kec. Aru Islands, Aru Islands Regency, Maluku. The population used in this study was 140 nurses at the Cendrawasih Dobo Regional General Hospital. The sampling technique used in this study was total sampling. Total sampling is a sampling technique where all parts of the population are used as samples, this happens because the population is relatively small. Data collection with questionnaires. Furthermore, the data that has been obtained is analyzed using Univariate, Bivariate, multivariate analysis.

RESULT AND DISCUSSION

Results
A. Univariate Analysis
1. Age

Table 1. Age Frequency Distribution

Age (years)	Frequency	Percentage (%)
25-30	48	40.0

31-35	33	27.5
36-40	33	27.5
41-45	6	5.0
Total	**120**	**100.0**

Table 1 shows the frequency distribution of age of 120 nurses who participated in the analysis of body posture, environment, and workload on neck and shoulder pain complaints at Cendrawasih Dobo Regional Hospital. The majority of nurses are in the age range of 25-30 years, with a frequency of 48 people or 40% of the total sample. The ages of 31-35 and 36-40 years each have 33 nurses, representing 27.5% for each age group. Meanwhile, nurses aged 41-45 years are the smallest group, with only 6 people or 5% of the total.

2. Weight

Table 2. Frequency Distribution of Body Weight

Body weight (kg)	Frequency	Percentage (%)
48-57	11	9.2
58-66	65	54.2
67-75	44	36.7
Total	**120**	**100.0**

Table 2 illustrates the frequency distribution of body weight of 120 nurses involved in the analysis of body posture, environment, and workload on neck and shoulder pain complaints at Cendrawasih Dobo Regional Hospital. The majority of nurses have a body weight in the range of 58-66 kg, which is 65 people or 54.2% of the total participants. The group with a body weight of 67-75 kg follows with a frequency of 44 people, representing 36.7% of the total. The group with the lowest body weight, which is 48-57 kg, consists of only 11 people or 9.2% of the total nurses studied.

3. Height

Table 3. Height Frequency Distribution

Height (cm)	Frequency	Percentage (%)
157-161	42	35.0
162-166	58	48.3
167-170	20	16.7
Total	**120**	**100.0**

Table 3 shows the frequency distribution of height of 120 nurses who participated in the analysis of body posture, environment, and workload on neck and shoulder pain complaints at Cendrawasih Dobo Regional Hospital. Most nurses have a height between 162-166 cm, with a frequency of 58 people or 48.3% of the total sample. The height group of 157-161 cm is followed by 42 people or 35%. Meanwhile, only 20 nurses or 16.7% have a height in the range of 167-170 cm, making it the smallest group in this distribution.

4. Working hours per day

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Table 4. Frequency Distribution of Working Hours per Day

Working hours per day (hours)	Frequency	Percentage (%)
8	96	80
9	22	18.3
10	2	1.7
Total	**120**	**100.0**

Table 4 shows the frequency distribution of working hours per day of 120 nurses who participated in the study on the analysis of body posture, environment, and workload on neck and shoulder pain complaints at Cendrawasih Dobo Regional Hospital. Most nurses work for 8 hours per day, with a frequency of 96 people or 80% of the total respondents. A total of 22 nurses, or 18.3%, work for 9 hours per day, while only 2 nurses, or 1.7%, work for 10 hours per day.

5. Exercise habits

Table 4. Frequency Distribution of Exercise Habits

Exercise habits	Frequency	Percentage (%)
Seldom	64	53.3
Sometimes	54	45.0
Often	2	1.7
Total	**120**	**100.0**

Table 5 shows the frequency distribution of exercise habits among 120 nurses who participated in the analysis of body posture, environment, and workload on neck and shoulder pain complaints at Cendrawasih Dobo Regional Hospital. Most nurses have infrequent exercise habits, with a total of 64 people or 53.3% of the total respondents. A total of 54 nurses, or 45%, reported exercising occasionally. Only 2 nurses, or 1.7%, exercised frequently, indicating that routine exercise habits were relatively low among the nurses studied.

6. Complaints of neck and shoulder pain

Table 5. Frequency Distribution of Neck and Shoulder Pain Complaints

Complaints of neck and shoulder pain	Frequency	Percentage (%)
Low	38	31.7
Currently	67	55.8
Heavy	10	8.3
Very heavy	5	4.2
Total	**120**	**100.0**

Table 6 shows the frequency distribution of neck and shoulder pain complaints among 120 nurses who participated in the study at Cendrawasih Dobo Regional Hospital. Most nurses experienced complaints with moderate severity, as many as 67 people or 55.8% of the total respondents. Complaints with low severity were reported by 38 nurses or 31.7%. Severe complaints were experienced by 10 nurses, representing 8.3%, while 5 nurses or 4.2% reported very severe complaints.

These data indicate that neck and shoulder pain complaints are a common problem among the nurses studied.

7. Body posture

Table 6. Frequency Distribution of Body Posture

Body posture	Frequency	Percentage (%)
Risk ignored	9	7.5
Low risk	51	42.5
Medium risk	57	47.5
High risk	3	2.5
Total	**120**	**100.0**

Table 7 shows the frequency distribution of body posture based on REBA assessment among 120 nurses studied at Cendrawasih Dobo Regional Hospital. Most nurses have moderate-risk body postures, namely 57 people or 47.5% of the total sample. Low-risk postures were reported by 51 nurses, representing 42.5%. Meanwhile, 9 nurses or 7.5% have negligible-risk body postures, and only 3 nurses or 2.5% have high-risk body postures. These data indicate that the majority of nurses are in the moderate to low-risk body posture category.

8. Workload

Table 7. Workload Frequency Distribution

Workload	Frequency	Percentage (%)
Not enough	64	53.4
Currently	43	35.8
Heavy	13	10.8
Total	**120**	**100.0**

Table 8 illustrates the frequency distribution of workload among 120 nurses involved in the study at Cendrawasih Dobo Regional Hospital. Most nurses reported a light workload, with 64 people or 53.4% of the total respondents. Moderate workload was experienced by 43 nurses, representing 35.8%. Meanwhile, 13 nurses, or 10.8%, reported a heavy workload. These data indicate that the majority of nurses face a relatively light to moderate workload.

B. Bivariate Analysis

a. Normality Test

Table 8. Kolmogorov-Smirnova Normality Test of Variables

Variables	P-value	Information
Complaints of neck and shoulder pain	0.004	Abnormal
Body posture	0,000	Abnormal
Workload	0,000	Abnormal

Table 9 presents the results of the Kolmogorov-Smirnov normality test for the variables studied. The p-value for neck and shoulder pain complaints is 0.004,

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for body posture is 0.000, and for workload is 0.000. A p-value smaller than 0.05 indicates that the data is not normally distributed.

b. Homogeneity Test

Table 9. Homogeneity Test of Variables

Variables	P-value	Information
Body posture	0.935	Homogeneous
Workload	0.512	Homogeneous

Table 10 shows the results of the homogeneity test for the variables studied. The P-value for body posture is 0.935 and for workload is 0.512, both of which indicate that the data from these two variables are homogeneous. This means that the variability in the sample group is relatively uniform, so that the observed differences can be analyzed without any significant difference in variance between groups.

c. The relationship between body posture and neck and shoulder pain complaints

Table 10. Pearson Correlation Test of the Relationship between Body Posture and Neck and Shoulder Pain Complaints

p-value	0,000
Pearson correlation	0.538

Table 11 shows the results of the Pearson correlation test for the relationship between body posture and neck and shoulder pain complaints. With a p-value of 0.000, this result indicates a statistically significant relationship between the two variables. The Pearson correlation value of 0.538 indicates a moderate positive correlation, meaning that the worse the body posture, the higher the level of neck and shoulder pain complaints.

d. Relationship between workload and neck and shoulder pain complaints

Table 11. Pearson Correlation Test of the Relationship between Workload and Neck and Shoulder Pain Complaints

p-value	0,000
Pearson correlation	0.442

Table 12 shows the results of the Pearson correlation test for the relationship between workload and neck and shoulder pain complaints. The P-value of 0.000 indicates that the relationship between the two variables is statistically significant. The Pearson correlation value of 0.442 indicates a moderate positive correlation, which means that the heavier the workload, the higher the level of neck and shoulder pain complaints.

C. Multivariate Analysis

Table 12. Multiple Linear Regression Test

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.597a	.356	.345	13,803

Table 13 shows the results of multiple linear regression tests used to evaluate the influence of independent variables (REBA and Workload) on the dependent variable. The R value of 0.597 indicates the strength of the linear relationship between the independent variables and the dependent variable. The R Square of 0.356 indicates that approximately 35.6% of the variation in the dependent variable can be explained by the independent variables in this model. The Adjusted R Square of 0.345 indicates adjustments to the number of independent variables and sample size. The Std. Error of the Estimate of 13.803 indicates how large the average prediction error of the regression model is.

Discussion

The Relationship between Body Posture and Neck and Shoulder Pain Complaints in Nurses at Cendrawasih Dobo Regional Hospital

This study proves that there is a relationship between body posture and neck and shoulder pain complaints. This is proven by the results of statistical tests with a p-value of 0.000 and a Pearson correlation value of 0.538. This indicates a moderate positive relationship, meaning that the worse the body posture, the higher the level of neck and shoulder complaints.

In general, people who experience musculoskeletal complaints start from habits that are done while working. If the work posture is not right and maintained for a relatively long duration, it can trigger the emergence of musculoskeletal complaints.(Alfara et al., 2017). Unnatural work posture is an attitude or posture of the body when working that causes parts of the body to move away from their natural position, such as a back that is too bent, a neck that is too up or down, and other positions that are not in accordance with their natural position.(Tarwaka, 2018).

A sitting position for a long period of time can cause complaints in the form of aches and pains in the neck, shoulders, spine, buttocks and stomach.(Tarwaka, 2018). According toSafitri et al. (2017), common symptoms of neck pain are pain and stiffness in the neck area, neck muscle pain and headaches. The pain can spread to the shoulders, arms and hands.

Shoulder Pain can occur due to injury or disease in the shoulder joint that can affect the ligaments, bursa, or tendons that surround the shoulder joint. Injuries can also affect the ligaments, cartilage, meniscus, and bones of the joint. The design of the shoulder joint is so mobile that the shoulder is at risk of injury. Common injuries to the shoulder include bursitis, tendonitis or tendinitis, rotator cuff tears, and instability and frozen shoulder(Kartika et al., 2021).

According toThe Last Supper (2018), when the muscles receive excessive workload repeatedly for a long time, musculoskeletal complaints will arise due to damage to joints, ligaments and tendons. According to Tarwaka's theory, it can be stated that one of the causes of neck pain complaints is workload. Previous studies related to the results of this study include:Bolghanabadi et al. (2017), AndKattang et al. (2018).

Work posture is the body position of workers in doing work. The risk of skeletal muscle problems will increase if the body posture has a position further away from the body's center of gravity.(Khofiyya et al., 2019). The work posture

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that causes MSDs in workers is an incorrect work posture and this is done continuously on a regular basis.(Sjarifah & Rosanti, 2019). Incorrect working posture is caused by the worker's upper and lower body parts bending when doing work such as lifting, passing, and moving loads.

Improper working posture will increase the risk because it requires maintaining muscle strength, if this situation is repeated for a long time, the possibility of MSDs is three times greater than workers who do it for a shorter time.(Prahastuti et al., 2021). Improper posture increases the risk of MSDs in the cervical, thoracic and lumbar spine at least twofold.(Leite, 2019). The speed of performing an incorrect posture is also a consideration. The speed factor is indicated by the number of technical actions (in minutes) performed by the worker, considering that the work requires more than thirty actions per minute.(Leite, 2019). Incorrect working posture is a risk factor when doing work with a duration of 10 seconds and a frequency of 2 times/minute.(Khofiyya et al., 2019).

Based on the discussion above, the researcher argues that body posture while working has a significant influence on the emergence of neck and shoulder pain complaints. This complaint is often experienced by workers, including nurses who have high physical work intensity and long work duration. Incorrect body posture, especially if done repeatedly over a long period of time, can cause muscle tension, impaired blood flow, and press on nerves in the neck and shoulder area. The accumulation of these conditions will eventually trigger the emergence of pain that can interfere with productivity and work quality. To reduce the risk of these complaints, it is important for nurses to obtain adequate knowledge about proper work posture. In this case, socialization and training related to work ergonomics need to be provided to nurses so that they are able to apply the correct posture when carrying out daily tasks. Thus, the risk of injury due to incorrect work posture can be minimized.

Relationship between Work Environment and Neck and Shoulder Pain Complaints in Nurses at Cendrawasih Dobo Regional Hospital

The results of this study obtained that the lighting in the hospital room was 52-348 lux, this does not comply with the hospital lighting standard of 100-200 lux. The results of the study for noise levels were also greater than the standard, namely >45Db. This mismatch between lighting and noise levels can be a factor causing neck and shoulder pain complaints.

Lighting in the hospital work environment plays a vital role in improving the performance, health and safety of staff and patients. Adequate lighting can improve staff performance by making it easier for them to perform visual tasks, which is especially important in spaces such as operating rooms and intensive care units where punctuality is key. Typical hospital lighting standards include 100-200 lux for non-sleeping patient rooms, with medium light colors(Irnawan, 2022). However, areas such as operating rooms and intensive care units require higher levels of lighting. The use of natural light is also very important, as it can increase staff and patient job satisfaction, although in some cases, such as primary inpatient wards, natural light may be obstructed by building structures or other environmental elements.(Ekantari, 2018).

Insufficient lighting can cause various problems such as eye complaints, including sore, dizzy, sleepy, and pain around the eyes. Research shows that inadequate lighting, such as in poorly lit pharmacy rooms, can cause eye fatigue in workers. Therefore, adequate lighting is very important to reduce discomfort and maintain eye health.(Pabala et al., 2021).

Effective lighting design should take into account the visual and biological needs of staff and patients. Human-centric design, which includes the use of dynamic and colored light, as well as lighting that can be adjusted to individual needs, can improve comfort and efficiency at work. The use of LED technology can also improve lighting efficiency, as LEDs offer flexible lighting and produce little heat, helping to control room temperature and improve patient comfort. Lighting also has important implications for patient care. Appropriate light can support the healing process by helping patients maintain their body's circadian rhythms.(Martian & Suri, 2017).

Noise in the hospital environment has a significant impact on the health of patients, staff and the overall performance of the hospital. High noise levels can negatively impact the well-being of patients and staff, prolong patient recovery time and increase the need for medication. (Savitri & Syafei, 2018).

Noise can also disrupt a patient's sleep, which is essential for speeding up the healing process. This sleep disruption can cause anxiety, reduce the patient's level of trust in the treatment, and worsen their condition. In addition, staff exposed to high levels of noise in the workplace can experience increased stress, which impacts their performance, leading to fatigue, anxiety, and even depression.(Afifah, 2020).

Hospital noise standards are regulated by Permenkes No. 7 of 2019, which stipulates that noise levels should not exceed 45 dB when patients are not sleeping. However, studies have shown that noise levels in hospitals often exceed recommended limits. Noise levels during the day can reach 72 dB(A), and at night they can reach 60 dB(A), which is far above the established standards.(Suhariyono, 2021).

Noise distribution in hospitals varies depending on the location and source of the noise. For example, noise from traffic or construction can increase the noise level around the hospital environment. This variation in noise can affect different areas of the hospital, including patient rooms and staff workspaces, making it difficult to maintain a quiet environment. Noise not only interferes with comfort, but can also affect patients' speech and cognitive processing abilities.(Novaria, 2017). The Lombard effect, where a person raises their voice to match the surrounding noise, can cause a decrease in speech intelligibility. This can be detrimental to patients and staff being able to communicate clearly, which can have a negative impact on the care process.(Mulyatna et al., 2017).

The air quality in a hospital environment has a significant impact on the health of patients and staff. Clean, healthy air can help prevent the spread of infection, as well as maintaining the physical and mental well-being of everyone in the hospital. Poor air quality can lead to a range of health problems, especially for those who are already vulnerable.(Amiroh et al., 2019).

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Poor air quality can increase the risk of nosocomial infections (hospital-acquired infections). Studies have shown that pathogenic microorganisms such as bacteria and fungi can spread through the air, causing infections in debilitated patients. In addition, poor air quality can also affect speech and cognitive processing, especially in patients, as noise and polluted air can interfere with clear verbal interactions.(Rahayu et al., 2019).

Hospital air quality standards are strictly regulated by various parameters that are monitored regularly. Physical parameters include temperature and humidity, while chemical parameters include levels of gases such as CO2. Microbiological parameters, such as the number of pathogenic microorganisms in the air, are also important for monitoring air quality in treatment rooms. According to Permenkes No. 7 of 2019, air quality in hospitals must meet the established quality standards. Although these standards are not always explicitly stated in some sources, hospitals are required to maintain air quality to protect the health of patients and staff. Routine measurements, including temperature, humidity, and other gases, are part of the monitoring process to ensure compliance with these standards.(Kanan et al., 2023).

Poor air quality in hospitals can be caused by a variety of factors, including inadequate ventilation, external contaminants, and building materials containing hazardous substances. In addition, microbes that thrive in closed environments can also affect air quality. All of these factors can worsen the health of hospital occupants, especially vulnerable patients.(Anggraeni, 2018).

Researchers suggest that inadequate lighting can trigger muscle tension, especially in the neck and shoulder area, as workers have to adapt to less than optimal visual conditions. This often forces nurses to work in uncomfortable and incorrect positions, which ultimately lead to neck and shoulder pain. In addition, noise levels that exceed normal thresholds can increase stress levels in workers, contributing to muscle tension and pain, including in the neck and shoulder area. Continuous stress from high noise exposure can lead to poor posture as nurses may become less focused on maintaining an ergonomic body position while working.

Relationship between Workload and Neck and Shoulder Pain Complaints in Nurses at Cendrawasih Dobo Regional Hospital

This study proves that there is a relationship between workload and neck and shoulder pain complaints. This is proven by the results of statistical tests with a p-value of 0.000 and a Pearson correlation value of 0.442. This indicates a moderate positive relationship, meaning that the heavier the workload, the higher the level of neck and shoulder complaints. The workload studied in this study includes physical load and work time/work duration.

Working hours are more at risk for shoulder pain complaints, this is possible because with increasing working hours, work activities are increasing, activities or movements that are done repeatedly can cause fatigue and over pressure, causing shoulder injuries. With increasing working hours, it will accumulate and cause more serious shoulder complaints.(Ramadhiani et al., 2017).

This is supported by research conducted byMcKenzie & Kubey (2014)which states that factors that cause and worsen shoulder pain include doing

repetitive activities or work or activities that cause over pressure on the shoulder which accumulates and has an impact on structural changes in the shoulder and causes pain.

The length of time maintaining a working posture can also be interpreted as the length of time/duration of exposure to risk factors. The longer the duration of exposure, the greater the risk of injury that will occur.(Octaviani, 2017). If the work continues for a long period of time, the body's ability will decrease and can cause complaints in the body.(Safitri et al., 2017). Thus, the longer the respondents maintain their posture while working, the greater the risk of neck pain complaints.

According toThe Greatest Showman (2016), with the result of p value = 0.940 (p > 0.05) that if the workload borne by the worker is not too heavy so that the pressure on the musculoskeletal system is not too great, it does not make the muscles always contract. So, when the body does not get too heavy a load, it does not have a big influence on the severity of the complaints felt.

According to researchSitumorang et al. (2020)which states that work posture has an effect on the emergence of neck pain complaints. In addition, researchWicaksono et al. (2016)concluded that there is a relationship between work posture and musculoskeletal complaints, one of which is neck pain. Therefore, there needs to be preventive efforts, namely by paying attention to good work posture and avoiding awkward positions while doing work.

The emergence of subjective complaints of neck pain can occur because the neck posture is too bent when working. This posture shows an unnatural posture, where this posture makes the body part, especially the neck, move away from the body's natural position/normal posture. Muscles will tire more easily when working in a static posture compared to when working with a dynamic posture. Static posture can cause neck muscle pain so that it can also reduce the functional ability of the neck(Melia et al., 2018). However, this is not the only factor that influences the emergence of neck pain complaints. According toThe Last Supper (2018), factors that influence the emergence of neck pain complaints include internal risk factors (age, gender, type of work, medical history) and external factors (sports activity, nutritional status, length of service, work environment, work posture).

Excessive workload is a risk factor for musculoskeletal disorders. This is because excessive workload can cause excessive muscle contractions and can be at risk of pain in the spine. Workload related to musculoskeletal disorders, namely if the workload can cause high muscle contractions due to large loads, for a long time, and in frequent frequencies(Khofiyya et al., 2019). Excessive muscle contractions will cause a decrease in blood flow to the muscles, as a result the oxygen supply to the muscles can decrease, the metabolic system in the body is hampered, and as a consequence there is a buildup of lactic acid which can cause pain, stiffness, and discomfort.(Devi et al., 2017).

Age is one of the risk factors for musculoskeletal disorders. Basically, musculoskeletal system complaints can be felt at working age, namely the age range of 25 to 65 years. Age is closely related to skeletal muscle complaints. Some experts say that age is one of the main triggers for muscle complaints.(Ferusgel & Rahmawati, 2018). There is a study that says that workers aged ≥ 38 years have a high chance of experiencing musculoskeletal disorders.(Prahastuti et al., 2021). It

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can be said that the older a worker gets, the more muscle complaints they experience.(Ferusgel & Rahmawati, 2018).

Working duration is the time in carrying out work done in the workplace. Working duration that is too long can cause workers to suffer from Musculoskeletal Disorders. Long working hours cause asymmetric muscle imbalances, which cause muscle pain, a manifestation of musculoskeletal disorders. Working hours above 8 hours can significantly cause pain in the upper limbs such as the shoulders, upper back, lower back and arms.(Utami et al., 2017).

Based on the research results and discussion above, the researcher concluded that neck and shoulder pain complaints are not solely caused by incorrect body posture while working. Excessive workload and long and continuous work duration without adequate rest breaks are also significant factors that contribute to the occurrence of this complaint. Excessive workload, such as repetitive physical activity and handling heavy tasks, can cause muscle tension in the neck and shoulder area. This is exacerbated by the lack of rest time, which does not give the body the opportunity to recover from the stress and tension caused during work. The combination of incorrect body posture, heavy physical load, and long working hours create an unergonomic work environment, increasing the risk of neck and shoulder pain complaints.

Researchers also argue that it is important to have a good rest time to reduce the risk of these complaints. Giving the body enough time to rest between busy work schedules can help reduce muscle tension and prevent the accumulation of physical stress on the body. Adequate rest allows the muscles involved in work activities to relax, reducing the risk of muscle injuries and other disorders. Therefore, in addition to improving work posture and reducing excessive workload, arranging a balanced rest time is an important step in preventing neck and shoulder pain complaints. Researchers recommend that workplace management pay attention to this in preparing work schedules and providing ergonomic training to workers to reduce the negative impact of continuous physical activity.

CONCLUSION

This study found a significant relationship between body posture and neck and shoulder pain complaints (p-value 0.000, correlation 0.538), as well as between workload and these complaints (p-value 0.000, correlation 0.442), indicating that the worse the body posture and the heavier the workload, the higher the level of pain complaints. In addition, the working environment conditions in hospitals, such as lighting that is not up to standard (52-348 lux) and noise levels exceeding 45 dB, also have the potential to trigger complaints in the neck and shoulder area, highlighting the need for improvements in ergonomics and the work environment. Further research can be focused on the development of technology-based ergonomic interventions, such as posture training with wearable sensors or modifications to the design of a more optimal workspace to reduce the risk of musculoskeletal complaints.

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