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The Correlation between Work Sitting Position and Musculoskeletal Disorders among State Civil Apparatus in Regional Financial Board of Mataram City

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ABSTRACT

Musculoskeletal disorders that affect the normal function of the musculoskeletal system due to repetitive activities or activities inappropriate postures that cause pain during work or rest. This study aims to determine whether there is a correlation between work sitting position and musculoskeletal disorders among State Civil Apparatus in Regional Financial Board of Mataram City. This research was conducted at the Regional Financial Board of Mataram City with 38 research subjects, consisting of 22 men and 16 women. The data collected using a questionnaire with a Nordic Body Map to determine level of musculoskeletal disorders and observation with a Rapid Upper Limb Assessment (RULA) instrument to assess work sitting position by state civil apparatus. This type of research is a non-experimental quantitative analytic with a cross-sectional approach and data analysis method used spearman rank correlation statistic, with the SPSS statistical program version 25. Musculoskeletal disorders mostly in low level experienced by respondents with 76.3% and assessment of work sitting position mostly in the category of further investigation and change soon with 57.9%. The correlation test is 0.001 ($p \leq 0.05$) and correlation coefficient value is 0.588. This study shows that there is a correlation between work sitting position with musculoskeletal disorders among State Civil Apparatus in Regional Financial Board of Mataram City.

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INTRODUCTION

Ergonomy is a study of the combination of knowledge, art, and technology which help people optimizing their works yet minimizing any injuries that may cause in their works (Tarwaka, 2004). Some studies have found that musculoskeletal disorders of upper extremities occurred because of the work load and the lacked of human knowledge in ergonomy (Punnet & Wegman, 2004).

Musculoskeletal disorders are conditions that occur from repeat actions which impact to the inequality of the musculoskeletal (*Occupational Health and Safety Council of Ontario*, 2007). Musculoskeletal disorders influences health that causes the limitation of physical movements. As a result, people who suffer from this disorder also effect their mental health which leads to some problems such as social distancing which lower their life qualities (Bliuc *et al.,* 2009; Dadoun *et al.,* 2013; Nüesch *et al.,* 2011; Widdifield *et al.,* 2015).

Musculoskeletal disorders that associated to working areas appears in muscles, tendons and nerves, the pain occurs during working or reses time (Xiong, 2020). According to basic health research (Riset Kesehatan Dasar) in 2018, joint pain was also common among PNS/TNI/POLRI/BUMN/BUMD which was on third position after farmer. It means that this condition is as higher as farmers. While, about 7.50% unemployed experienced this pain. The data shows that many employers in Indonesia experiencing musculoskeletal disorders, they experienced the pain in lower neck (80%), shoulder (20%), back (40%), waist (40%), hips (20%), bottom (20%), tights (20%), knees (60%) and legs (80%) (ILO, 2018).

It is important, for people to considered their posture when doing any activities such as sitting upright, bending down and or sitting half. Sitting for a long time in an upright position leads to cramp on the vertebralis, especially on lumbar (Santoso, 2013).

Many studies about musculoskeletal that have been conducted explained about muscles that experienced cramp, for examples neck muscle, shoulders muscles, arms muscles, hands, fingers, back, waist and muscles around lower part of the body. In similar, this was experienced by people who work as state civil apparatus both in ministry level or regional level. This study was conducted in Regional Financial Board of Mataram City.

The State Civil Apparatus generally works in a sitting position for a long period of time. In similar, this was experienced by the State Civil Apparatus who work in Regional Financial Board of Mataram City, it can causes abdominal

muscles become more elastic, spine curved, and eye muscles quickly feel tired. This incident, if not balanced with an adequate facilities can causes pain in back muscles, neck muscles, and eye muscles (Kuswana, 2014). Regional Financial Board of Mataram City works in the field of income that manages all the original regional income from the other board/department, earth and bulding tax services, then budgeting is in terms of planning money management, and handling regional assets which when working their tend in a sitting in an upright position and unergonomic posture for 7 – 8 hours with 2 hours rest time, then inadequate facilities. It can increase the risk of musculoskeletal disorders experience by State Civil Apparatus in Regional Financial Board of Mataram City.

METHODS

This research used a quantitative non-analytic experiment with a cross-sectional approach. Sitting position as the independent variable and musculoskeletal disorders as the dependent variable. The data collection was carried out at one time with an observation method used Rapid Upper Limb Assessment (RULA) instrument to assess the sitting position and Nordic Body Map questionnaire to assess musculoskeletal disorders of State Civil Apparatus in Regional Financial Board of Mataram City.

The population in this research was the State Civil Apparatus in Regional Financial Board of Mataram City. The sampling technique used purposive sampling with the inclusion criteria in this research, namely, (1) Willing to be a respondent; (2) Working in a sitting position for 4 hours/day.

RESULTS AND DISCUSSION

Result

1. An Overview of Work Sitting Position

Table 1 - An Overview of Work Sitting Position

Hasil	Frequency	Percentage (%)
Acceptable posture	0	0
Further investigation and change may be needed	9	23.7
Further investigation and change soon	22	57.9
Investigate and implement change	7	18.4
Total	38	100

Source: SPSS version 25

Based on table 1, it is known that the most work sitting position of State Civil Apparatus in Regional Financial Board of Mataram City are included in the category of further investigation and change soon with a percentage of 57.9%.

2. An Overview of Musculoskeletal Disorders

Table 2 - An Overview of Musculoskeletal Disorders

Result	Frequency	Percentage (%)
Normal	4	10,5
Low	29	76.3
Moderate	5	13.2
High	0	0
Very High	0	0
Total	38	100

Source: SPSS version 25

Based on table 2, it is known that the result of musculoskeletal disorders of State Civil Apparatus of Regional Financial Board of Mataram City are mostly at low level with a percentage of 76.3%.

3. Cross Tabulation between Musculoskeletal Disorders and Age Range

Table 3 - Cross Tabulation between Musculoskeletal Disorders and Age Range

Age range	Score					
	Normal	Low	Moderate	High	Very High	Total
17-25 years old (late teens)	0	1	0	0	0	1
26-35 years old (early adulthood)	1	4	1	0	0	6
36-45 years old (late adulthood)	1	8	3	0	0	12
46-55 years old (early elderly)	2	16	1	0	0	19
Total	4	29	5	0	0	38

Source: SPSS version 25

From the table above, data shows that the most of respondents is in the age range of 46 – 55 years old (early elderly) which experiencing musculoskeletal disorders, namely 19 respondents and 16 respondents included in the category of low level of musculoskeletal disorders.

4. Cross Tabulation between Musculoskeletal Disorders and Work Sitting Position

Table 4 - Cross Tabulation between Musculoskeletal Disorders and Work Sitting Position

Sitting work position	Score					
	Normal	Low	Moderate	High	Very High	Total
Acceptable posture	0	0	0	0	0	0
Further investigation and change may be needed	3	6	0	0	0	9
Further investigation and change soon	1	20	1	0	0	22
Investigate and implement change	0	3	4	0	0	7
Total	4	29	5	0	0	38

Source: SPSS version 25

Table 4 shows that the most respondents in the category of further investigation and change soon, namely 22 respondents who experiencing low level of musculoskeletal disorders, but in the table above there are 4 respondents includes investigate and implement change and experiencing moderate level of musculoskeletal disorders.

5. Cross Tabulation between Musculoskeletal Disorders and Gender

Table 5 - Cross Tabulation between Musculoskeletal Disorder and Gender

Gender	Score					
	Normal	Low	Moderate	High	Very high	Total
Men	4	16	2	0	0	22
Woman	0	13	3	0	0	16
Total	4	29	5	0	0	38

Source: SPSS version 25

In table 5, data shows that women experienced moderate level of musculoskeletal disorders more than men, as many as 3 respondents.

6. Cross Tabulation between Musculoskeletal Disorder and Working Period

Table 6 - Cross Tabulation between Musculoskeletal Disorder and Working Period

Working period	Score					
	Normal	Low	Moderate	High	Very High	Total
1-5 years	1	3	1	0	0	5
6-10 years	1	4	1	0	0	6
>10 years	2	22	3	0	0	27
Total	4	29	5	0	0	38

Source: SPSS version 25

The data in table 6 shows that majority respondents are >10 years of working period, namely 27 respondents with a moderate level of musculoskeletal disorders as many as 3 respondents.

7. Cross Tabulation between Musculoskeletal Disorder and Smoking Habit

Table 7 - Cross Tabulation between Musculoskeletal Disorder and Smoking Habit

Smoking habit	Score					
	Normal	Low	Moderate	High	Vert High	Total
Yes	2	8	0	0	0	10
No	2	21	5	0	0	28
Total	4	29	5	0	0	38

Source: SPSS version 25

Based on table 7, data obtained that majority respondents didn't have a smoking habit (total 28 respondents) with a moderate level of musculoskeletal disorders as many as 5 respondents.

8. Hypothesis Test Analysis

This research used an ordinal data scale, which is included in the category of non-parametric statistics, therefore doesn't perform a normality test. The hypothesis test used Spearman rank correlation.

Table 8 - Spearman Rank Correlation Hypothesis Test Analysis

		RULA	NBM
RULA	*Correlation coefficient*	1	0.588
	p-value		0.001
NBM	*Correlation coefficient*	0.588	1
	p-value	0.001	

Source: SPSS version 25

In table 8, data shows that the p-value is 0.001 ($p \leq 0.05$) which indicates that the hypothesis was accepted and spearman rank correlation coefficient value is 0.588, it has a moderate correlation with a positive direction, which

means the higher result of assessment of sitting position, the higher risk of musculoskeletal disorders experienced.

Based on the correlation test result, it showed that there is a correlation between work sitting position and musculoskeletal disorders in State Civil Apparatus of Regional Financial Board of Mataram City

Discussion

The result showed that there was a correlation between work sitting position and musculoskeletal disorders in State Civil Apparatus of Regional Financial Board of Mataram City. This evidenced by the p-value 0.001 ($p \leq 0.05$), which means the hypothesis was accepted and the correlation coefficient value 0.588, it has a moderate correlation with a positive direction. So, the higher result of assessment of sitting position, the higher risk of musculoskeletal disorders experienced.

This research showed that the most of respondents was in the age range of 46 – 55 years old (early elderly) which experiencing low level of musculoskeletal disorders, namely 16 respondents and 1 respondent with moderate level of musculoskeletal disorder. In table 3 showed that the age range of >30 years old increase occurred individuals with musculoskeletal disorders. The age factor influences health of workers that causes low back pain. Setbacks at age 30 years old such as tissue regeneration to scar tissue, fluid loss, and tissue destruction. This leads to a decrease in muscle and bone stability. The older of individual, the higher risk of individual experiencing a decrease in bone elasticity that influences appearance of symptoms of musculoskeletal disorders (Trimuanggara, 2010).

Sitting position which was assessed using Rapid Upper Limb Assessment (RULA) instrument showed that the most respondents in the category of further investigation and change soon who experienced low level of musculoskeletal disorders, but in the table 4 showed there are 4 respondents includes investigate and implement change which experienced moderate level of musculoskeletal disorders. Working position both sitting or standing for a long time can causes health problem in the short or long term. Musculoskeletal disorders are divided in several types, such as pain in neck. Pain in neck are common occur at work caused by work with a continuous sitting position (Permatasari & Widajati, 2018).

This research showed that women more risk of experiencing musculoskeletal disorders than men. Physiologically, men's muscle strength is greater than women's. The ratio in muscle disorders between men and women is 1:3 (Tarwaka, 2014). The factor of hormonal also

effect in musculoskeletal disorders between women and men. Women's hormone influences her be smoother in physically, the growth of women's body completeness and the presence of lipid tissue in body parts that men doesn't have (Helmina, 2019).

The longer period of working, the more individuals experiencing musculoskeletal disorders. Musculoskeletal disorders are chronic diseases that take a long time to develop and manifest (Tarwaka, 2010). Musculoskeletal disorders will increase if the individual's working period also increases, then causes physical and psychological boredom (Tarwaka, 2014).

This research showed that smoking doesn't affect individuals experience of musculoskeletal disorder. The influence of smoking habits on the risk of musculoskeletal disorders is still debated by experts, but some studies have shown that the increase in musculoskeletal disorders is closely related to the length and level of smoking habits (Tarwaka, 2004). Study about correlation between smoking habits and musculoskeletal disorders in fisherman at Desa Kalinaun Kecamatan Likupang Timur Kabupaten Minahasa Utara showed that smoking habits doesn't affect musculoskeletal disorders in fishermen. The other research also showed that the result of statistic test obtained p = 0.473 (p>0.05), which means smoking habits don't have a significant correlation between musculoskeletal disorders in manual handling activity (Januar, 2015). It means, two research which explained before are supports of this research, namely smoking habit doesn't influence individuals experience of musculoskeletal disorders.

CONCLUSION

In accordance with the analysis conducted on 38 respondents, it can be concluded that there is moderate correlation between work sitting position and musculoskeletal disorders among State Civil Apparatus in Regional Financial Board of Mataram City.

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