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Investigating The Link Between Sitting Habits And Low Back Pain In Administrative Staff: A Cross-Sectional Study

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Abstract.*The research aims to determine the relationship between sitting habits (position and duration) and the occurrence of low back pain in administrative employees at the Regional General Hospital of Prof. Dr. H. M. Anwar Makkatutu Bantaeng Regency in 2024. This study employs a quantitative descriptive design with cross-sectional study. A sample of 28 participants from 30 populations based on inclusion criteria using total sampling techniques. Data analysis used the chi-square test (X^2) and Spearman's rank correlation coefficient (ρ) with a confidence level of 95%. Based on the analysis, there is a relationship between sitting position and the incidence of low back pain (p= 0.025), the level of relationship is moderate (ρ=0,573), and there is a relationship between sitting duration and the occurrence of low back pain (p= 0.044), the level of relationship is moderate (ρ=0.534).*

Keywords: *Sitting habits, Low back pain, Sitting posture*

INTRODUCTION

Low back pain (LBP) is a common health problem faced by administrative workers in public service institutions, including hospitals. LBP is a musculoskeletal disorder or pain that occurs in the lower back due to excessive physical activity (Mardiati et al., 2023). LBP complaints in administrative staff are caused by body posture when working with a tilted left or right body position, a static position for a long time, an incorrect sitting position, a stooped posture, and a head that is always lowered (Wahyuningtyas et al., 2019). The spine plays the most important role in maintaining the body in a sitting position and is also the organ most susceptible to complications from sitting for too long (Pramana & Adiatmika, 2020). A study by Pratiwi et al. (2020) in Indonesia found that workers who sit for more than 6 hours per day are twice as likely to experience LBP compared to workers who sit for less than 4 hours per day. A study by Rahmat et al. (2019) in Indonesia found that an unergonomic sitting position, such as slouching, increases the risk of LBP by up to 50%. Pratiwi & Wulandari (2022), a study in Indonesia showed that the prevalence of LBP in office workers who sit for more than 8 hours per day is 60%. Falah & Izzati (2021), sitting for more than 4 hours per day doubles the risk of LBP. Van der Beek et al. (2022), slouching and unergonomic sitting positions increase the risk of LBP by up to 3 times. The prevalence of LBP in the world based on data from The Global Burden Of Disease increased to 8.86% in 2017 and is a major cause of disability. Riskesdas data in 2018 showed that musculoskeletal problems with joint complaints from a doctor's

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diagnosis in the community aged ≥15 years in Indonesia were 7.30% (Mardiati et al., 2023). The prevalence of low back pain according to WHO (2022) data states that musculoskeletal disorders in the world amounted to 1.71 billion, while the incidence of low back pain is the 3rd health problem in the world, amounting to 17.3 million people. The prevalence according to Riskesdas (2021) in Mastuti & Husain (2023), the incidence of LBP in Indonesia is 12,914 people or 3.71% and ranks 2nd after influenza.

Global prevalence of LBP reaches 84%, with 57% of people experiencing LBP at least once in their lifetime (Chou & Deyo, 2020). The prevalence of LBP in Southeast Asia ranges from 45% to 70% (Hartvigsen et al., 2021), and in East Asia, the prevalence of LBP ranges from 50% to 80% (Pengel et al., 2020). The 2018 Basic Health Research showed the prevalence of LBP in Indonesia to be 27.7%. The prevalence of LBP in Indonesia is higher in women (30.2%) than in men (25.2%). The prevalence of LBP in South Sulawesi is 28.2% and is higher in women with 31.4% compared to men with 25% (Kemenkes, 2018). Data from the Bantaeng District Health Office in 2022 shows that LBP is one of the most common diseases treated in primary health care, with an average of 200 cases per month. Data from the information system of Prof. Dr. H. M. Awar Makkatutu General Hospital 2022 reported low back pain (diagnosis code M54.4) in 2022 for outpatient treatment with 429 patients. Inpatient visits with 34 patients. Data on the 10 largest outpatient diseases in 2022, LBP ranks 8th. Information in 2023 the total number of outpatient LBP patients is 820 people. The number of inpatients is 25 people. Data on the 10 largest outpatient diseases in 2023, LBP ranks third. From the above, it shows that the number of patients has increased from 2022 to 2023 is 82,5%

Prolonged sitting with non-ergonomic posture can cause musculoskeletal complaints (Hutasuhut et al., 2021). Administrative workers who sit for long extended periods of sitting are at risk of developing back pain. Non-ergonomic chairs also affect the formation of pain because they feel uncomfortable, causing muscles to become stiff and can cause pain (Firdaus, 2020). A person or employee who does work is at risk of getting LBP and 90% of cases are not caused by organic abnormalities, but by incorrect body position when working (Iskandar et al., 2020). LBP itself is also often referred to as a musculoskeletal disorder that can lead to decreased work productivity. Every year there are 15% - 45% of adults who suffer from LBP and an average of 35 - 55 years old (Ones et al., 2021). This age group continues to exhibit remarkable productivity and can make valuable contributions to society. Experiencing LBP will lower the quality of service to the public. There is an increase in employee absenteeism and an increase in healthcare costs. Leijon et al. (2021), a study in Sweden showed that office workers who experience LBP lose an average of 10 working days per year, and interventions

by reducing sitting time can help prevent LBP in office workers. Van der Beek et al. (2022), an ergonomic sitting position is associated with a 20% reduction in the risk of LBP. Pratiwi & Wulandari (2022), in Indonesia, showed that office workers who experience LBP lose an average of 5 working days per year, and ergonomic interventions (including sitting time arrangements) can reduce LBP pain in office workers by up to 40%. Data from the physical therapy installation of Prof. Dr. H. M. Anwar Makakkatutu General Hospital shows that physiotherapy interventions have been carried out on several administrative hospital employees with LBP, namely 4 people in 2022 and 5 people in 2023. The number of administrative employees at Prof. Dr. H. M. Anwar Makakkatutu General Hospital, Bantaeng Regency, has a level of LBP incidence that deserves attention. Low Back Pain (LBP) significantly hinders the productivity of administrative staff, posing a critical concern for workplace well-being and efficiency. Based on the accreditation data of Prof. Dr. H. M. Anwar Makakkatutu General Hospital, this aspect has not received attention from the occupational safety and health committee or hospital management. There has been no research on work factors, especially sitting time and sitting position, on the incidence of LBP in the hospital, so the author feels interested and challenged to conduct this research. The purpose of this study is to determine the relationship between sitting habits (position and duration) and the occurrence of LBP in administrative staff at Prof. Dr. H. M. Anwar Makakkatutu General Hospital, Bantaeng Regency in 2024.

METHODOLOGY

Type of research descriptive quantitative design with analytic correlation using a cross-sectional study. Sample in this study, the population or total sampling is used. The population in this study is all administrative staff in the unit/installation 30 respondents, but only 28 respondents were selected. Some respondents entered administrative roles with pre-existing risk factors for LBP, including a body mass index (BMI) exceeding the normal range and a history of lower back injuries. The research was conducted from January to April 2024. Independent variables are the sitting habits (position and duration). The dependent variable is the occurrence of low back pain. Research instruments using questionnaires and cross-checking with a camera. Hypothesis testing with chi-square and the level of correlation using Spearman's rank correlation coefficient using the International Business Machines Corporation Statistical Program for Social Science (IBM SPSS) 25 program.

RESULTS AND DISCUSSION

A. Sitting position

Table 1 Frequency Distribution of Sitting Positions

Sitting Time	N	%
Upright sitting	7	25
Leaning sitting	8	28,6
Slouching/leaning forward	13	46,4
Total	**28**	**100,0**

The results of the study showed that the frequency distribution of sitting positions of administrative staff at Prof. Dr. H.M. Anwar Makkatutu General Hospital was: 7 people (25%) sat upright, 8 people (28.6%) leaned back, and 13 people (46.4%) slouched/leaned forward. This data provides an interesting picture of how the sitting positions of administrative staff at Prof. Dr. H.M. Anwar Makkatutu General Hospital are distributed. Based on the analysis of the existing data, it can be concluded that the majority of administrative staff tend to choose a slouching or leaning forward sitting position when carrying out their duties. Specifically, this sitting position is chosen so that they can focus more and adjust their view to the computer or customers, as well as make adjustments when entering data and running administrative services to patients or family members in various units or hospital installations. This fact shows that administrative staff have responsibilities that require a high level of concentration and direct interaction with technology and other people.

Several previous studies that have been mentioned also provide interesting insights. For example, according to Wulandari (2021), a leaning forward sitting position is often used when carrying out activities such as promoting service products, handling administrative and customer complaints, and providing responses to customer questions through various communication channels such as telephone, email, or chat. Pratama (2020), also adds that this position is generally chosen when typing data from documents into a computer, making letters, verifying, and editing data. Other studies, such as those highlighted by Guo et al. (2021), show that administrative work often involves sitting positions that involve bending or twisting the body, which is consistent with the findings in this study. They also highlight that the choice of a leaning forward sitting position can be influenced by the fit between the administrative staff's sitting height and their desk and chair. This emphasizes the importance of ergonomic aspects in the work environment to prevent health problems associated with unnatural posture. This ergonomic factor is also emphasized by the National Institute of Occupational Safety and Health (2020), which emphasizes that the fit between the height of the desk and chair can influence the choice of a leaning forward sitting position. Therefore, the provision of

ergonomic work equipment is key to reducing the risk of injury or health problems associated with unnatural posture. These findings provide a deeper understanding of administrative work practices in hospitals and highlight the importance of factors such as ergonomics in creating a healthy and productive work environment. By understanding the common sitting patterns chosen by administrative staff, hospitals, and other institutions can take steps to improve the well-being and work efficiency of their employees.

B. Sitting duration

Table 2 Frequency Distribution of Sitting Duration

Sitting Duration	N	%
Less than 4 hours	1	3,6
5-8 hours	13	46,4
More than 8 hours	14	50
Total	**28**	**100,0**

The results of the study showed that the frequency distribution of sitting duration of administrative staff at Prof. Dr. H.M. Anwar Makkatutu General Hospital was: 1 person (3.6%) sat for less than 4 hours, 13 people (46.4%) sat for 5-8 hours, and 14 people (50%) sat for more than 8 hours. This data shows that the majority of administrative staff at Prof. Dr. H.M. Anwar Makkatutu General Hospital sit for more than 8 hours a day. This is in line with previous studies that have found that administrative work often involves prolonged sitting (Hutasuhut et al., 2021; Pratiwi & Wulandari, 2022).

The results of the study also showed that the majority of administrative staff at Prof. Dr. H.M. Anwar Makkatutu General Hospital work in units/installations with high administrative service demands, such as the emergency room, inpatient services, laboratory, and radiology. This is likely one of the reasons why so many administrative staff report sitting for more than 8 hours a day. The findings of this study are supported by the results of other research. According to Setyaningrum (2022), the physical workload of administrative staff generally involves static sitting for 5-8 hours per day, and some even exceed 8 hours. Haryanto (2023) also noted that the administrative work position often involves static sitting for 8 hours per day. These findings are in line with research by Kastelic et al. (2018), which emphasizes that many people spend most of their time in a sitting position, especially in work environments. Current technological advancements are also one of the factors causing this trend, as technology-related jobs often require employees to sit for long sustained sitting.

Therefore, it is important to raise awareness of posture health and ergonomics in the hospital administrative work environment. Providing facilities that support changes in position,

appropriate rest breaks, and promoting physical activity in the workplace can help reduce the risk of health problems associated with prolonged sitting. These steps are important to improve the well-being and productivity of administrative staff, as well as to prevent potential injuries or health problems that can arise from unnatural posture.

C. Occurrence of low back pain

Table 3. Frequency Distribution of LBP Occurrence

Kejadian LBP	N	%
No LBP	5	17,9
Mild LBP pain	22	78,6
Moderate LBP pain	1	3,6
Severe LBP pain	0	0
Total	**28**	**100,0**

The data on the distribution of low back pain (LBP) in administrative staff at Prof. Dr. H. M. Anwar Makkatutu General Hospital shows that the majority of them experience LBP with a low level of severity. Based on the results of the study, it was revealed that 5 people (17.9%) of the administrative staff did not experience LBP, while 22 people (78.6%) experienced LBP with mild pain, and only 1 person (3.6%) experienced LBP with moderate severity. The mild pain category refers to pain that comes and goes, particularly during everyday activities, and usually resolves with sleep (Nurul et al., 2023). These findings are in line with the results of a study conducted by Leijon et al. (2021) in Sweden, which showed that 70% of office administrative workers experience LBP. The impact of the high incidence of LBP is very significant on the performance of administrative staff. If not handled properly and immediately, LBP can lead to higher absenteeism from work, especially if the severity of LBP increases. According to a study by Chou et al. (2021), LBP that is initially mild can develop into more severe pain if not treated properly. Therefore, proper handling of LBP in administrative staff is very important to avoid its negative impact on their performance and well-being. Effective prevention and management measures need to be implemented, including education on ergonomics, changes in work patterns, physical exercise, and medical interventions that are appropriate to the needs. Thus, it is hoped that the risk of LBP can be managed well, thus improving the quality of life and productivity of administrative staff at Prof. Dr. H. M. Anwar Makkatutu General Hospital.

D. Relationship between sitting position and the occurrence of low back pain

The results of the hypothesis testing using the Chi-Square test statistic showed a p-value of 0.025 ($p < 0.05$). This indicates that there is a significant relationship between sitting position and the occurrence of LBP. The Spearman's rank correlation coefficient test showed a strength

of association of 0.573, which is categorized as a moderate association (value 0.40 - 0.599). The results of the hypothesis analysis confirm that there is a significant correlation between sitting position and the occurrence of low back pain (LBP), with a moderate strength of correlation. From these findings, it can be seen that non-ergonomic sitting positions can increase the risk of LBP. The worse the sitting position, the higher the risk of LBP that may arise. Poor sitting posture, a consequence of non-ergonomic chairs, directly increases pressure on the intervertebral discs, potentially leading to LBP. The risk of LBP in individuals with poor sitting positions can be minimized by improving their sitting positions. However, the moderate strength of the correlation indicates that sitting position is not the only factor that contributes to LBP. Other factors also play a role in causing LBP, such as age, weight, sitting duration, and physical activity level.

These findings have several important implications, including the importance of paying attention to sitting position when working, studying, or doing other activities. Chairs should be equipped with backrests that can properly support the lower back, and the height of the chair and desk should be adjusted so that the elbows are aligned with the keyboard and mouse. If the feet are not comfortable on the floor, a footrest can be used. The position of sitting with crossed legs should be avoided as it can compress the nerves and blood vessels behind the knees, which can cause pain, impaired blood flow, blood clots, tingling, and numbness in the legs, as stated by Taylor et al. (2023) & Kubo et al. (2021). This position can also put additional pressure on the spine, according to research by (Chang et al., 2020). The position or arrangement of the laptop/computer and documents on the desk should also be adjusted to allow for effective and efficient movement. It is recommended to do light movements or stretches every 30 minutes, or stand up and move around for a few minutes every hour. Regular physical activity can help improve blood flow to the brain, which in turn can increase energy and focus to improve productivity and performance.

. Improper sitting patterns, such as slouching or twisting the body, can increase the load on the spinal structures in the lower back, including the intervertebral discs, facet joints, and ligaments. This increased pressure can lead to inflammation, injury, and pain (Cho & Lee, 2020). Frequent complaints of back pain can be caused by the habit of sitting in an incorrect position. In such a working position, the main muscles involved in work will experience isometric contraction (against pressure), while the back muscles must bear the load from the upper limbs that are active. As a result, the load will be concentrated in the lumbar area, causing the main supporting lumbar muscles to become easily fatigued and potentially cause pain (Agustin et al., 2023). According to Hoy et al. (2021), prolonged sitting can lead to sustained

static muscle contractions, which in turn trigger muscle fatigue, tension, and spasms. Muscle spasms can increase pressure on the spinal structures and surrounding nerves, which then triggers pain. Levy et al. in Prateyo et al. (2022), also noted that pressure on the spine will increase when sitting, compared to standing or lying down. In comparison, if the pressure on the spine when standing is considered 100%, sitting upright can increase the pressure to 140%, while in a forward-leaning position, the pressure can reach 190%. These findings are supported by research by Van der Beek et al. (2022), which shows that an ergonomic sitting position can reduce the risk of LBP by up to 20%.

E. Relationship between sitting duration and the occurrence of low back pain

The results of the hypothesis testing using the Chi-Square test statistic showed a p-value of 0.044 ($p < 0.05$). This indicates that there is a significant relationship between sitting duration and the occurrence of LBP. The Spearman's rank correlation coefficient test showed a strength of association of 0.534, which is categorized as a moderate association (value 0.40 - 0.599). The results of the hypothesis analysis confirm that there is a significant correlation between sitting duration and the occurrence of Low Back Pain (LBP) with a moderate strength of association. Prolonged sitting is considered to contribute to the static pressure received by the muscles and spine, which in turn can trigger muscle tension and fatigue. Exposure to a static sitting position for a long sustained sitting also has the potential to increase the risk of systemic inflammation and reduce blood flow to the muscles, thus slowing down the recovery process and increasing the risk of LBP. In addition, the lack of movement variation when sitting for a long sustained sitting can lead to weakness of the core muscles that play a role in stabilizing the spine. This can slow down metabolism and increase the risk of obesity, which is an additional risk factor that contributes to the risk of LBP. While the strength of association found is moderate, it reinforces that sitting duration is not the only factor that influences the risk of LBP. While sitting duration is a contributing factor, several other factors play a significant role in the development of LBP. Based on these findings, some recommendations can be put forward, namely: (1) Implementing strategies to reduce sitting time, such as using reminders to stand and move every 60 minutes. (2) Integrating short physical activities into the daily routine, such as taking short walks or doing simple stretches. (3) Encouraging the adoption of an active and flexible work culture to reduce the duration of long static sitting periods, for example by providing facilities for standing or moving periodically during working hours. These steps are expected to help reduce LBP-related risks and improve spinal health and overall well-being for individuals susceptible to these problems. Sitting in a static position for a long sustained sitting can cause continuous contraction of the paravertebral muscles and

ligaments in the lower back area. This effect can result in muscle fatigue, tension, and spasms, which can ultimately trigger the onset of pain (Cho & Lee, 2020). The pressure received by the spine when in a prolonged sitting position causes increased pressure on the lower spine, especially on the intervertebral discs. This high level of pressure can lead to tissue damage and inflammation, which then becomes a trigger for pain.

Lack of physical activity, especially prolonged sitting, can weaken the back and core muscles. Weak muscles are unable to support the spine properly, thus increasing the risk of LBP (Pengel et al., 2020; Hartvigsen et al., 2021; Chou & Deyo, 2020). These findings are supported by research by Pratiwi & Wulandari (2022), conducted in Indonesia, which showed that the prevalence of LBP in office workers who sit for more than 8 hours per day reaches 60%. From the above explanation, it can be concluded that prolonged sitting in a static position hurts the muscles, ligaments, and spine, which can ultimately increase the risk of LBP. Therefore, it is important to pay attention to ergonomic sitting positions and ensure that there is variation in movement and physical activity in daily routines to prevent the occurrence of LBP.

CONCLUSION

The results of this study show that there is a significant relationship between sitting habits (position and duration) and the occurrence of LBP in administrative staff at Prof. Dr. H.M. Anwar Makkatutu General Hospital, Bantaeng Regency in 2024. The findings of this study have several important implications. First, they highlight the importance of considering posture and sitting duration when designing workplaces and work tasks for administrative staff. Second, they suggest that interventions to reduce the risk of LBP in administrative staff should focus on promoting ergonomic work practices, such as providing adjustable chairs and desks, encouraging frequent breaks, and promoting physical activity. Third, the findings of this study can be used to inform the development of workplace health and safety policies and programs aimed at preventing LBP in administrative staff. Further research is needed to explore the mechanisms by which sitting position and sitting duration influence the risk of LBP in administrative staff. Additionally, research is needed to identify effective interventions to reduce the risk of LBP in this population.

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