

Published online on the journal's website: <http://josi.ft.unand.ac.id/>

Journal of Engineering Science and Technology Management

| ISSN (Online) 2828-7886 |



Article

Analysis of Low Back Pain Prevention Strategies Based on Work Environment and Attitude Evaluation of Back Office Employees

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ARTICLE INFORMATION

Volume 5 Issue 1
 Received: 18 February 2025
 Accepted: 26 March 2025
 Published Online: 27 March 2025
 Online: at <https://JESTM.org/>

Keywords

Lower Back Pain
 Work Attitude
 Work environment
 Occupational Diseases
 Ergonomics

ABSTRACT

The work environment affects employee health, especially in offices where most employees sit for long periods. One common health issue is lower back pain, which can be caused by poor posture, non-ergonomic chairs and desks, and uncomfortable work settings. Initial observations showed that many employees had improper sitting postures and workstations that did not meet ergonomic standards. This research aimed to identify the factors that cause lower back pain and to find strategies for prevention and treatment. The study was conducted at a health facility using a quantitative method with a cross-sectional approach. A total of 34 back-office employees participated as respondents. Data were collected through a lower back pain questionnaire, the RULA (Rapid Upper Limb Assessment) worksheet to assess work posture, interviews, and field observations. The results showed that 20 employees (58.82%) experienced lower back pain. Factors that contributed to this condition included age, length of service, physical workload (EMK), and work posture. Among these, work posture was found to be the most significant factor ($p = 0.022$). To reduce lower back pain among employees, several strategies were suggested: forming an Occupational Health and Safety (OHS) evaluation team, improving the work environment and systems, and providing education about correct posture and back pain prevention. These steps aim to create a healthier work environment and reduce future complaints of back pain.

1. BACKGROUND

1.1 Introduction

The work environment is closely related to the conditions around the worker's activities in doing their work. Interaction between workers, work and the work environment is certainly unavoidable because it is part of life activities. More than 35% of the time in a worker's life is in their work environment. (Budiono et al., 2008). The office is a work environment and must meet the provisions in Workplace (Health, Safety, and Welfare). Although the office is generally considered safe, it still contains health hazards that can cause injury to workers. While most accidents and occupational health problems in the office are solely caused by work attitudes (Nurmianto, 2008).

The sitting work position is the main choice for all workers and is considered the most comfortable and not tiring. However, the sitting work position can put quite heavy pressure on the lower back and cause lower back pain in workers (Anjanny, 2019). Complaints of Lower Back Pain are one of the occupational diseases and are the most frequently reported complaints. Based on the report of The Bureau of Labor Statistics, it shows that almost 20% of all cases of work-related illness are caused by complaints or back pain. Meanwhile, the National Safety Council reports that the most frequent work-related illness is back pain, which is 22% of 1,700,000 cases (Water, et al, 1996 in Tarwaka, 2010).

One of the risks of developing low back pain (Low Back Pain) increases if in his work he does not pay attention to the correct sitting position, the position of the table, the size of the chair that is not ergonomic (Anjanny, 2019). An unergonomic work system in a company often gets less attention or is considered trivial by the management or human resource managers in the company. Examples include incorrect working positions, inappropriate facilities, and additional working hours outside the set working hours (Budiono, 2005).

Hospitals are service facilities engaged in health services that have various complex workforce problems with various risks of contracting occupational diseases and even work-related accidents according to the type of work so that they are obliged to implement efforts to foster Hospital Occupational Safety and Health. The contents of Article 23 of Law No. 23 of 1992 concerning health state that every workplace is required to provide occupational health. Based on this statement, hospitals as one of the workplaces are also required to provide occupational health for their workers to avoid potential hazards in the hospital (Putri et al, 2018).

In addition to employing medical personnel, hospitals also employ non-medical personnel, namely back office employees to provide services to

the public who come to the hospital. Non-medical employees or back office employees at the Hospital work in a sitting position and use computers for quite a long time. Initial observation results showed irregular work postures or sitting positions of employees in doing their work in the hospital work environment. In addition, the seating and work desk facilities are not in accordance with the employee's posture and are not ergonomic, and this can cause complaints of lower back pain to employees at the hospital.

1.2 Research Purposes

employees who do a lot of work on their desks and sit for a long time are at risk of experiencing lower back pain. Many impacts will arise if the tools and design of the work environment have poor ergonomics will have a negative effect on work attitudes, make work harder, increase workload and as a result will reduce the quality of work (Prasetyo et al, 2015).

This is the reason for conducting research on lower back pain in Hospitals in Pekanbaru. It is necessary to carry out prevention and treatment strategies for complaints of lower back pain so that employee performance and hospital performance improve. Occupational safety factors are important because they are closely related to employee performance and ultimately hospital performance in providing services to the community who come to the hospital.

2. LITERATURE REVIEW

2.1 Occupational Diseases

Occupational safety factors are important because they are closely related to employee performance and in turn to company performance. The more available occupational safety facilities are, the less likely there will be work accidents. Occupational diseases among health and non-health workers in Indonesia have not been well recorded. As a causal factor, it often occurs due to a lack of worker awareness and inadequate work quality and worker skills. Many workers underestimate the risks of work, so they do not use safety equipment even though it is available (Ningsih, 2016).

Occupational diseases are diseases caused by work, work tools, materials, processes or work environment. Thus, occupational diseases are artificial or man-made diseases. In line with this, there is another opinion stating that occupational diseases (PAK) are health disorders, both physical and mental, that are caused or exacerbated by work activities or conditions related to work. There are several common causes of PAK in the workplace, one of which is due to ergonomic or physiological factors (Ningsih, 2016).

2.2 Ergonomics

Nurmianto (2004), Ergonomics is the study of human aspects in the work environment viewed from the perspective of anatomy, physiology, psychology, engineering, management and design.

According to Santoso (2013) there are 4 main objectives of ergonomics, namely:

1. Maximizing employee efficiency
2. Improving occupational health and safety
3. Encourage safe, comfortable and enthusiastic work
4. Maximizing convincing work forms

2.3 Musculoskeletal Disorders(MSDs)

According to Tarwaka (2010), Musculoskeletal Complaints are complaints in the skeletal muscle parts felt by a person ranging from very mild complaints to very painful. A semi-quantitative method that evaluates the potential for muscle fatigue in most parts of the body through assessments based on the level of effort of a job, the duration of continuous effort, and the frequency of effort. If muscle fatigue occurs, injury will occur more easily.

Still according to Tarwaka (2010), body parts that are potentially experiencing muscle fatigue are grouped into low, moderate, and high so that priority treatment can be identified to avoid muscle injury. If the muscles receive static loads repeatedly over a long period of time, it will cause complaints in the form of damage to the joints, ligaments, and tendons. One of the diseases caused by Musculoskeletal Disorders is Low Back Pain

2.4 Low Back Pain

Lower back pain is pain felt in the lower back whose source is the spinal area, muscles, nerves, or other structures around the area. Lower back pain can be caused by diseases or disorders originating from outside the lower back, for example diseases or disorders of the back (Suma'mur, 2009).

Difficulty in straightening up after bending due to stiffness or pain is a very common symptom/complaint of lower back pain or Low Back Pain (LBP). 80% of humans in their life journey

have suffered from LBP. Symptoms of LBP include muscle pain, stabbing or sharp pain, discomfort or pain in the back area, pain that radiates to the lower legs and feet, limited flexibility or range of motion of the back joints, and difficulty standing upright (Prasetio, 2015).

3. METHODOLOGY

The population used in this study were hospital back office employees, initial observation of the number of employees was 34 people, because the population size allowed for the study as a whole, a saturated sample of 34 people was used. The tools used were the Lower Back Pain Questionnaire and RULA Worksheet, stationery, meter and digital camera. The study was conducted with a quantitative approach with a survey method. Data collection was carried out cross-sectionally. The lower back pain complaint questionnaire was used to determine the RULA lower back pain complaint for work posture. After that, prevention and treatment strategies were determined for lower back pain complaints.

After the back pain data is obtained by filling out the questionnaire, then the work attitude calculation is carried out with the RULA Worksheet. Where the researcher makes observations, fills out the RULA Worksheet, and scores the RULA for each employee. Then analyze 3 factors, namely individual factors, ergonomic factors, environmental factors to find out which factors influence (pvalue < 0.05), after that recalculate to find out which factors have the most influence from the factors that influence lower back pain. Then create a strategy for preventing and handling lower back pain complaints based on the results of the research that has been done.

4. Results and Discussion

4.1 Overview of Lower Back Pain Complaints

The following is the frequency distribution for each factor used, which can be seen in table 1.

Table 1. Frequency Distribution

No	Variables	frequency	%	No	Variables	frequency	%
1	Age			4	EMK		
	Ideal	8	23.53		Ergonomic	6	17.65
	At risk	26	76.47		Not Ergonomic	28	82.35
		34	100			34	100
2	IMT			5	Work Attitude		
	Normal	1	2.94		Good	7	20.59
	Abnormal	33	97.06		Not good	27	79.41
		34	100			34	100

3	Years of service			6	Lower Back Pain		
	Low	9	26.47		No complaints	14	41.18
	Tall	25	73.53		There are complaints	20	58.82
		34	100			34	100

From the table data above, it is obtained for a description of complaints of lower back pain in current employees, there are complaints of lower back pain, namely 20 employees (58.82%) experience lower back pain, 33 employees (97.06%) have an abnormal BMI, 25 employees (73.53%) with high work experience, there are 28 EMK (82.35%) who are not ergonomic, 27 employees (79.41%) with poor work attitudes.

4.2. Relationship Between Individual, Ergonomic, and Environmental Factors Affecting Low Back Pain

The following is a table of the results of the calculation of the relationship between lower back pain complaints and factors that influence it with a p value of 0.05. It can be seen in table 2 as follows.

Table 2 Relationship of Factors with Low Back Pain Complaints

Factor		Lower Back Pain Complaints		P Value
		There are complaints	No complaints	
Age	Ideal	2 (25%)	6 (75%)	0.038
	At risk	18 (69.2%)	8 (30.8)	
		20 (58.8%)	14 (41.2%)	
IMT	Normal	0 (0%)	1 (100%)	1
	Abnormal	20 (60.6%)	13 (39.4%)	
		20 (58.8%)	14 (41.2%)	
Years of service	Low	2 (22.2%)	7 (77.8%)	0.017
	Tall	18 (58.8%)	7 (28.0%)	
		20 (58.8%)	14 (41.2%)	
EMK	Ergonomic	1 (16.7%)	5 (83.3%)	0.044
	Not ergonomic	19 (67.9)	9 (32.1%)	
		20 (58.8%)	14 (41.2%)	
Work Attitude	Good	1 (14.3%)	6 (85.7%)	0.022
	Bad	19 (70.4%)	8 (29.6%)	
		20 (58.8%)	14 (41.2%)	
Working time	Ideal	21 (61.8%)	13 (38.2%)	0.306
	Not ideal	0 (0%)	0 (0%)	
		21 (61.8%)	13 (38.2%)	

From table 2 above, it can be seen that the factors that influence lower back pain in employees are age, length of service, EMK and work attitude. Age is not the main factor causing lower back pain complaints, age is a combination factor causing lower back pain, meaning that age does not stand alone as a cause of lower back pain but there are other more dominant causative factors (Tarwaka, 2004 in Munir 2012).

For the work period factor, the observation

results obtained that employees work in a fairly long work period from a young age to over 35 years old still working in the hospital, so that the impact of back pain complaints has accumulated. Work period has a strong relationship with muscle complaints, the longer the work period the higher the risk of lower back pain. If workers with high work period do not experience lower back pain complaints, it is likely because workers are used to the work they do.

For the EMK factor, in line with research conducted by Amilda Utami that there is an

influence of the application of ergonomic chairs on furniture craftsmen. Ningsih (2016), that work fatigue can be caused by a poor environment including those that affect the ergonomics of work positions. There is a decrease in complaints in the waist, back, left hand and left leg, after using an ergonomic chair (Utami, 2018).

For work attitude factors, From the results of observations in hospitals, almost all employees do not pay attention to their work attitudes, and employees work in front of computers for quite a long time. Lack of employee knowledge about work attitudes makes them work according to their own wishes without paying attention to what a good work attitude is like. Poor work attitudes will affect lower back pain and will interfere with employee activities while working. This is in line with research conducted by Sakinah (2012), where there is a relationship between work attitude factors or body posture to lower back pain in brick workers. The work attitude of hospital back office employees is often done in front of a computer with a working position that is a sitting position for quite a long time. The sitting work attitude requires more energy considering that the lower back as a support for working in a sitting position continuously is very likely to cause blood and various body fluids to accumulate in the legs (Sunaryo 2014 in Sakinah 2012).

4.3. Analysis of the Most Influential Factors on Low Back Pain Complaints

Table 3 will explain the factors that influence complaints of lower back pain in employees of RSIA Eria Bunda Pekanbaru.

No	Factors that influence	Pvalue
1	Age	0.038
2	Years of service	0.017
3	EMK	0.044
4	Work Attitude	0.022

After knowing the influencing factors, a recalculation was carried out using logistic regression analysis to determine which factors most influenced the occurrence of complaints of lower back pain. The results obtained from the calculation were that only the work attitude factor most influenced complaints of lower back pain, namely with a p value of < 0.05 . The results of this study are in accordance with the research conducted by Saputra Simanjuntak (2018), that there is a relationship between work attitude and complaints of lower back pain in ulos weavers (Simanjuntak, 2018).

In this study, work attitudes were measured using the RULA method by observing and filling out the RULA worksheet, in this RULA measurement aspect the work attitudes that were seen or measured consisted of the neck, back, lower arms, upper arms, wrist posture, load and hand grip. So that from these measurements, the work attitude or work posture can be known when employees are working.

The working attitude of hospital back office employees is almost all working with a sitting work attitude and doing work activities using computers for a long period of time. The chairs and tables used are not ergonomic, the lighting in the work room also does not meet the standards of a good work room. The incompatibility between humans and their work facilities (Tables and Chairs) can create an unergonomic (unnatural) working attitude. An unnatural working or sitting posture can cause complaints of lower back pain in certain parts of the body.

4.4 Handling Strategy

1. Forming a separate K3 evaluation team for handling lower back pain. Creating a separate K3 team is one of the things that must be done by every company, especially hospitals. With the existence of a proper and correct K3 management system, it will facilitate the growth and increase the competitiveness of the hospital, and can realize the welfare of workers. In addition, with the K3 system in the hospital, it will be easier if there are problems with employees or the work environment, so that it is faster to handle.
2. Improving the system and work environment in accordance with regulations. Improvements to the system and work environment should be done as much as possible. One of the factors that can affect employee performance is the work environment. A work environment that focuses on employees to be able to improve performance. Conversely, an inadequate work environment will be able to reduce performance and ultimately the productivity of the hospital will also decrease. By making changes to the work system and environment in hospitals in accordance with the Regulation of the Minister of Health of the Republic of Indonesia No. 48 of 2016 concerning Office Occupational Safety and Health Standards, such as making improvements to employee desks and chairs, then providing education and information to employees regarding lower back pain, it is hoped that the handling of lower back pain complaints can be resolved properly.
3. Improving education and information about

lower back pain for employees. Providing education and information to hospital employees about lower back pain is one of the strong strategies that can be done by the hospital. Because by providing education to employees, it will increase broader and deeper knowledge, and will avoid inconsistencies or irregularities, especially regarding what factors cause lower back pain. Meisatama et al's research, also obtained research results by improving work stations and providing William's Flexion Exercise had an effect on reducing complaints of lower back pain, reducing workload and increasing work productivity.

5. CONCLUSION

Based on the results of the study, questionnaire distribution and data processing, the current condition of lower back pain complaints in the Hospital is that there are complaints of lower back pain experienced by back office employees and this is influenced by individual factors, ergonomics and the environment in the hospital. Based on the calculation analysis, there is a relationship between age, length of service, EMK, work attitude towards complaints of lower back pain. The work attitude factor is the factor that most influences complaints of lower back pain from other factors.

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