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Risk factors for subjective complaints of Low Back Pain (LBP) in District X Office Workers Bandung City, Indonesia

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Abstract

Data from the Central Bureau of Statistics shows that 26.74% of the population aged 15 years and over in Indonesia who work experience complaints and health problems. Office workers are synonymous with high-frequency computer use and sitting for too long without paying attention to ergonomics. This raises the risk of fatigue such as arm pain, wrist pain, neck pain, and lower back pain. The purpose of this study was to determine the risk factors for subjective complaints of Low Back Pain in X District office workers in Bandung, Indonesia. This type of research is quantitative by using cross-sectional. A sample of 41 workers was obtained using the total sample technique. Data analysis used the chi-square test. The results of the study showed that 31 workers (75.6%) had complaints of Low Back Pain. Individual characteristic factors associated with the occurrence of low back pain were age (p = 0.000), gender (p = 0.012), years of service (p = 0.000), body mass index (p = 0.0018) and those that were not related were habits exercise (p = 0.369). Occupational factors related to the occurrence of low back pain were work posture (p = 0.047) and length of time using the computer (p = 0.000). So it is suggested that workers pay attention to work positions when doing work and improve work posture to reduce the risk of low back pain.

Keywords: Low Back Pain; Risk Factors; ROSA; Occupational Health

1. Introduction

Improving the performance of workers in an agency needs to be done properly and correctly. Worker performance is one of the main capitals of work performance. The existence of good and productive employee performance cannot be separated from attention to the welfare of workers. Because the welfare of employees is very influential on the good workplace. The welfare of workers is not seen from the big wages but from the comfort, health, and disturbance of the complaints that are felt. Based on the information data center of the Indonesian Ministry of Health, the application of occupational health and safety is a rule or system that supports the welfare of workers. Identically it is often applied in the industrial and trade sectors, but for offices, especially service offices, it is still not comprehensive, as seen from health complaints of 25.19%.[1].

Office activities continue to increase which increases the use of computers/laptops for office workers who are repetitive and at risk from an ergonomics perspective. This can result in the office workers having an increase in physical and psychological complaints in workers which results in MSDs (Musculoskeletal Disorders), one of which is Low Back Pain complaints in the office workers. According to Djaali and Fajriah Musculoskeletal disorders have occurred in many people due to a lack of health education in the workplace and a lack of training for workers to prevent them so they have a negative impact [2]. Because office workers identically use high-frequency computers and sit for too long without paying attention to the ergonomic aspects of work which carries risks. The risks posed by experiencing fatigue such as arm pain 35%, wrist pain 30%, neck pain 30%, back pain 43%.

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One of the risks that stands out for office workers is ergonomics because the position of the repetitive work posture is sitting, not to mention the long time of working using the computer and the time the worker has worked, his sports habits which can cause MSDs complaints, especially LBP (Low Back Pain) complaints. The X Bandung District Office is an office in charge of population services which has the main duties and functions of implementing general government affairs, and coordinating community empowerment activities. Coordinating efforts to maintain public peace and order Coordinating the application and enforcement of local regulations and district heads regulations as well as the creation of dominant identities are carried out by workers using computers. The results of the distribution of questionnaires and interviews showed that there were workers who complained of low back pain. This study aims to determine the risk factors for subjective disability of Low Back Pain in office workers in District X Bandung.

2. Material and methods

This research design uses cross-sectional or cross-sectional. The variables of this study include the characteristics of age, gender, years of service, length of time using the computer, BMI working posture, exercise habits, and complaints of Low Back Pain. The variable for this study used the Pain and Distress scale questionnaire created by William Zung in 1983, a questionnaire consisting of 20 questions where the process was given directly by workers to fill in themselves. The 20 questions relate to limitations in carrying out daily activities and habits that reflect low back pain. This scale has 20 items in it, 4 items for favorable statements and 16 for unfavorable statements. The alternative answer choices available for this scale are always, often, rarely, and never. The scores that will be given to favorable statements include always= 4, often= 3, rarely= 2, and never= 1. whereas for unfavorable statements the opposite applies, namely always= 1, often= 2, rarely= 3, and never= 4. This score indicates the level of pain.

The working posture variable is measured using the ROSA (Rapid Office Strain Assessment) instrument, one with the office ergonomics method, where this method is designed for quick analysis by measuring risks related to computer work and determining the level of risk of change based on reports of discomfort. These risk factors are given increasing values starting from 1-3. From the final value of the ROSA calculation, a value between 1-10 will be obtained. So, if the final score obtained is greater than 5 then it is at high risk and further assessment should be carried out at the workplace concerned. This method also considers the length of time a worker is in such a position, as well as the stipulation of the length of time [3].

The research workers were workers who used computers for office workers in X Bandung District, totaling 41 workers in the research process. The distribution of questionnaires was done by interviewing using The Pain and Distress scale and observing observations using the Rapid Office Strain Assessment (ROSA) instrument for office workers in X Bandung District. Univariate analysis was carried out quantitatively in the form of percentages, and bivariate analysis used the chi-square test.

3. Result

In this study, data was collected by distributing questionnaires, and ergonomic risk observations were carried out using ROSA. The research results are as follows:

Table 1 Distribution of Research Variable

Variable	**n**	**%**
Age		
< 35 Years	13	31.7
≥ 35 Years	28	68.3
Sex		
Male	23	56.1
Female	18	43.9
Years of Service		
< 5 Years	9	22.0
≥ 5 Years	32	78.0

Duration of Computer Use		
<4 Hours	8	19.5
≥4 Hours	33	80.5
Work Posture		
No Risk	7	17.1
At Risk	34	82.9
BMI		
Normal	14	34.1
Overweight	21	51.2
Obesity	6	14.6
Sports Habits		
Ideal	7	17.1
Not Ideal	14	34.1
Never exercise	20	48.8
Keluhan LBP		
No Complaints	10	24.4
Complaints	31	75.6

Table 1 shows that there are 41 employees, most of whom are aged ≥ 35 years as many as 28 workers (68.3%). Gender of office workers in District X Bandung, out of 41 workers, more than half were male, 23 workers (56.1%). Nearly all workers have a working period of ≥ 5 years (Old Employees) as many as 32 workers (78.0%). The duration of work using computers for almost all workers is at risk as many as 33 workers (80.5%). In the working posture of office workers in District X Bandung, almost all workers are at risk, 34 workers (82.9%). The BMI of office workers in District X Bandung is more than half Overweight as many as 21 workers (51.2%). 20 workers have never exercised (48.8%). Almost all office workers in District X Bandung stated that there were LBP complaints as many as 31 workers (75.6%).

Table 2 LBP Risk Factor Relationship with LBP Complaints

Variable	**Low Back Pain**				**Sig.**	**PR**	**95% CI**	
	No Complaints		Complaints					
	n	%	n	%			Lower	Upper
Age								
< 35 Years	8	19.5	5	12.2	<0.001	8.651	3.366	128.535
≥ 35 Years	2	4.9	26	63.4				
Sex								
Male	2	4.9	21	51.2	0.012	0.196	0.21	0.667
Female	8	19.5	10	24.4				
Years of Service								
< 5 Years	7	17.1	2	4.9	<0.001	8.296	4.716	242.704
≥ 5 Years	3	7.3	29	70.7				
Duration of Computer Use								

<4 Hours	6	14.6	2	4.9	0.001	6.188	3.216	147.099
≥ 4 Hours	4	9.8	29	70.7				
Work Posture								
No Risk	4	9.8	3	7.3	0.047	3.238	1.095	35.355
At Risk	6	14.6	28	68.3				
BMI								
Normal	7	17.1	7	17.1	0.018	Not Assumed	Not Assumed	Not Assumed
Overweight	3	7.3	18	43.9				
Obesity	0	0	6	14.6				
Sports Habits								
Ideal	2	4.9	5	12.2	0.369	Not Assumed	Not Assumed	Not Assumed
Not Ideal	5	12.2	9	22.0				
Never exercise	3	7.3	17	41.5				

Table 2 shows that there is a relationship between age (p-value= <0.001), sex (p-value= 0.012), years of service (p-value= <0.001), duration of computer use (p-value= 0.001), work posture (p-value = 0.047), (p-value = BMI 0.018) with LBP complaints. As for the habit of exercise, it is not related to LBP complaints.

4. Discussion

The results of the research on the risk factors associated with age and complaints of low back pain in 41 workers in the District X Bandung office found that a small proportion of 8 workers (19.5%) aged <35 years stated that they had no complaints of low back pain and that stated there were complaints of 5 workers. (12.2%). Meanwhile, 2 workers (4.9%) said there were no complaints of Low Back pain > 35 years of age. And more than half stated that there were complaints by 26 workers (63.4%). The results of the analysis obtained information on the value of PC (pearson chi square) with sig 0.000 <0.05. This shows that there is a relationship between age and complaints of low back pain in office workers in District X Bandung. Based on the results of research that has been done, according to Lukmanulhakim and Solihin musculoskeletal complaints begin to be felt at the age of 25-65 years, as seen from the phenomenon of office workers in District X Bandung where more than half are > 35 years old and are categorized as middle age so that subjective complaints of LBP are at risk for all workers[4]. This study shows different results from the results of research conducted by Aulia, Wahyuni and Jayanti which shows that there is no relationship between age and low back pain complaints [5]. Workers who experience low back pain are due to working too long and also increasing age in workers which can increase the risk of experiencing reduced elasticity in bones and stability in muscles.

The results of the research on the risk factors associated with gender and complaints of low back pain in 41 office workers in X Bandung District found that a small proportion of 4 workers (4.9%) namely men said they had no complaints of low back pain and more than half said they had complaints. as many as 5 workers (12.2%). Meanwhile, women who stated that they had no complaints of Low Back pain were a small proportion of 8 workers (19.5%). And those who stated that there were complaints were 10 workers (24.4%). The results of the analysis obtained information on the value of PC (pearson chi square) with sig 0.012 <0.05. This shows that there is a relationship between gender and complaints of low back pain in office workers in District X Bandung. Based on the results of research that has been done, according to Harrington and Gill men and women have the same risk of LBP complaints [6]. The results show that there is a gender factor that is related to influencing LBP complaints in X Bandung district office workers, men and women have the same risk of LBP complaints. This research is supported by previous research by Rasyidah, Dayani and Maulani entitled Work Period, Work Attitude and Gender with Complaints of Low Back Pain[7]. The results of statistical data analysis showed that there was a significant relationship between gender and complaints of Low Back Pain in the staff of the Neurology Polyclinic at Royal Prima Jambi Hospital with a p-value of 0.012. Many previous studies have proven that age is related to ergonomic risks, for example, the relationship between age and complaints of carpal tunnel syndrome [8].

The results of research on the risk factors associated with length of service and complaints of low back pain in 41 office workers in District X Bandung found that a small proportion of 7 workers (17.1%) of new workers stated that they had no complaints of low back pain and that stated there were complaints of 2 workers (4.9%). Meanwhile, old workers who stated that they had no complaints of low back pain were a small proportion of 3 workers (7.3%). And more than half stated that there were complaints by 29 workers (70.7%). The results of the analysis obtained information on the value of PC (pearson chi square) with sig 0.000 <0.05. This shows that there is a relationship between years of service and complaints of low back pain in office workers in District X Bandung. Based on the results of research that has been done, the longer a person's working life, the longer they are exposed to exposure at work, the higher the risk of occupational diseases. This theory supports the phenomenon in the field of sub-district office workers where more workers work for more than 5 years or are categorized as old workers. This research is supported by previous research Atthariq Waha p-value of 0.031 was obtained, and it was stated that there was a statistically significant relationship between years of service and complaints of Low Back Pain[9].

The results of research on risk factors associated with length of work using computers with complaints of low back pain in 41 office workers in District X Bandung found that a small proportion of 6 workers (14.6%) workers who were not at risk stated there were no complaints of low back pain and those who stated there were complaints as many as 2 workers (4.9%). Meanwhile, only 4 workers (7.3%) who were at risk stated that they had no complaints of Low Back pain. And more than half stated that there were complaints by 29 workers (70.7%). The results of the analysis obtained information on the sig value of 0.001 <0.05. This shows that there is a relationship between the length of work using computers and complaints of low back pain in office workers in District X Bandung. Based on the results of the research that has been done, according to Situmorang's theory, the duration of computer use can result in an accumulation of musculoskeletal complaints. The phenomenon with the occurrence of subjective complaints of Low Back Pain in sub-district office workers X Bandung in 2022, the fact is that almost all sub-district workers use computers for > 4 hours duration so this can be at risk of developing LBP complaints. This research is supported by previous research by Tarawifa *et al.*, 2022 There is a relationship between the duration of computer use and back pain with a p-value: 0.011 in Jambi University medical students [10]. This is also in line with research Wicaksono, Suroto and Widjasena there is a relationship between the duration of work using a laptop with musculoskeletal complaints with a p-value: 0.030 in students of the engineering faculty majoring in architecture at Diponegoro University [11].

The results of the research on the risk factors associated with work posture and complaints of low back pain in 41 office workers in X Bandung District found that a small proportion of 4 workers (9.8%) with non-risk work posture stated no complaints of Low Back pain and those who stated there were complaints 6 workers (9.8%). Meanwhile, only 3 workers (7.3%) had risky work postures stating that there were no complaints of Low Back pain. And more than half stated that there were complaints by 28 workers (68.3%). The results of the analysis obtained information on the value of PC (pearson chi square) with sig 0.047 <0.05. This shows that there is a relationship between work posture and complaints of low back pain in office workers in District X Bandung. Static muscle load occurs when the muscles are in a tense state without producing even a hand or leg movement. The condition of muscle tension is a condition of holding the body weight. So poor posture at work both in sitting and standing positions will increase the risk of musculoskeletal system disorders. Judging from the phenomenon of office workers in sub-district X Bandung, it was found that the work posture was not good, plus most of the chairs were non-adjustable, starting from height, backrests, and related armrests. This study corrects the results of previous research by Cahyani, Hasan and Rumastika about the relationship between the risk of work posture and the incidence of low back pain Jember University Library Employees concluded that there was no relationship between the two [12]. This study confirms the results of the study Sumardiyono, Fajar and Mulyani with the title Relationship of Work Posture to Low Back Pain Complaints of Tea Pickers PT Perkebunan Tambi Wonosobo which concluded that there is a relationship between work posture and LBP complaints [13].

The results of the research on the risk factors associated with BMI and complaints of low back pain in 41 office workers in District X Bandung found that a small proportion of 7 workers (17.1%) with normal BMI who were not at risk stated there were no complaints of Low Back pain and who stated there were complaints of 7 workers (17.1%). Overweight BMI who stated that there were no complaints of Low Back pain were only 3 workers (7.3%). And less than half stated that there were complaints by 18 workers (43.9%). Meanwhile, 6 workers (14%) are obese, indicating that there are complaints. The results of the analysis obtained information on the value of PC (pearson chi square) with sig 0.018 <0.05. This shows that there is a relationship between BMI and complaints of low back pain in office workers in District X Bandung. Based on the results of the research that has been done, if someone is overweight, the fat will be distributed to the abdominal area, which means that the work of the lumbar spine will increase. When you gain weight, the spine will be pressed to withstand the load so that damage to the bone structure can easily occur and it is dangerous for the spine. Looking at the phenomenon of workers in the X Bandung sub-district, who are almost all overweight, this affects the work posture of the worker's BMI. This research is supported by previous research by Mulfianda, Desreza and Maulidya regarding the factors associated with the incidence of Lower Back Pain (LBP) in workers at the Aceh Regional

PLN Office, it was found that the value of P = 0.003, which means P = <0.05. Thus it can be concluded that there is a relationship between the BMI factor and the causes of low back pain in PLN office workers [14].

The results of the research on the risk factors associated with exercise habits and complaints of low back pain in 41 office workers in the X Bandung District office found that a small proportion of 2 workers (4.9%) who often exercised said they had no complaints of Low Back pain and who stated there were complaints of 5 workers. (12.2%). Only 5 workers (12.2%) said they rarely exercised. And those who stated that there were complaints were 9 workers (22.0%). Meanwhile, 6 workers (14%) who never exercised stated that they had no complaints. Less than half, as many as 17 workers (41.5%) stated that they had complaints of Low Back Pain. The results of the analysis obtained information on the value of PC (pearson chi square) with sig 0.369 <0.05. This shows that there is no relationship between exercise habits and complaints of low back pain in office workers in District X Bandung. Based on the results of the research that has been done, sports habits are habits that are carried out by a series of regular and planned exercises to improve functional abilities. Looking at the phenomenon of workers, almost half of workers never do sports, but they always stretch while working, so it affects the relaxation of the body. This research is supported by previous research by Halipa and Febriyanto about the Relationship between Exercise Habits and Low Back Pain Complaints in Heavy Equipment Operators. From the results of data analysis using the chi-square test, the value of p = 0.545 (p> 0.05) is obtained, this means that Ha is rejected and H0 is accepted, so it can be concluded that exercise habits have no relationship with low back pain in heavy equipment operators [15].

5. Conclusion

Based on the results of the study, it can be concluded that more than half of workers are aged ≥ 35, male sex, and almost all respondents are (Old Employees) whose working period is more than ≥ 5 years. Frequency distribution of computer use duration ≥ 4 Almost all respondents were at risk, almost all respondents' work posture was risky, BMI frequency distribution was more than half Overweight for X Bandung sub-district office employees, the frequency distribution of exercise habits was less than half and never exercised, and almost all workers have LBP complaints. There is a relationship between age, gender, length of work time using computers, work posture, and Body Mass Index with the occurrence of subjective complaints of Low Back Pain in employees of the sub-district X Bandung office. Meanwhile, exercise habits are not related to the occurrence of subjective complaints of Low Back Pain in X Bandung sub-district office employees.

Compliance with ethical standards

Acknowledgment

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Compliance of Conflict of interest

The authors have no financial or other potential conflict of interest to disclose.

Statement of Informed Consent

All respondents had obtained research information, filled out informed consent, and agreed to participate. Researchers maintain research ethics and ensure the confidentiality of the pekerjat's identity.

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