

# Risk Factor

*by* Yusuf Handoko

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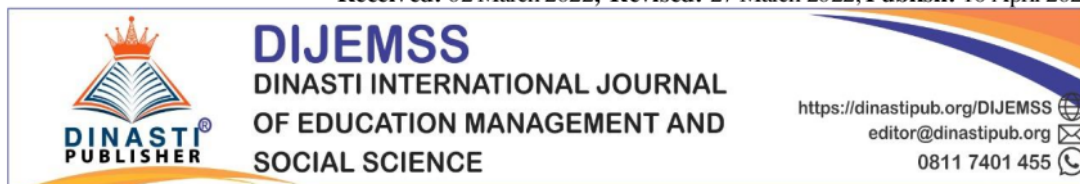
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**LITERATURE REVIEW RISK FACTOR OF LOWER BACK PAIN IN OFFICE WORKERS WITH VIDEO DISPLAY TERMINAL (VDT)**

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**Abstract:** Lower back pain (LBP) has become the most common musculoskeletal condition in developing countries. In Indonesia, it ranges from 3-17% affected by LBP. This is also related to the use of Visual Display Terminal (VDT), because the use of VDT is also related to one's sitting position. It is also known that, LBP is the third leading cause of occupational diseases caused by using VDT. Literature reviews that are based on articles and journals customized to PICO (population, intervention, control, output). Journals were searched in medical databases through Google Scholar, JOEM, and the Cochrane Library, using the keywords "low back pain", "risk factor", "office worker" and "VDT". From 4 selected journals, it was found that gender, age, Body Mass Index (BMI), sitting duration, working period, computer use, sitting position, LBP history became a risk factor for LBP occurrence and proved to be related to LBP because it has a value of  $p < 0.05$ . Workers working with VDT who experienced significant lower back pain were found to be more numerous in female workers, workers with an age range of 40-50 years, smokers, workers who had worked in the range of 1-21 years, previous LBP history, BMI >25, using computers 4-6 hours a day, working overtime, and also work experience with computers for 6-15 years.

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**Keywords:** Risk Factors, Low Back Pain, Office Workers, VDT

## INTRODUCTION

Low back pain (LBP) has become the most common musculoskeletal condition in developing countries<sup>(1)</sup>, and the prevalence of low back pain is increasing among office workers in general<sup>(1)</sup>. Low back pain has a profound impact both directly and indirectly on both workers and their families<sup>(2)</sup>.

Haiou Yang said research conducted over 35<sup>4</sup> years has identified a number of demographic, behavioral, health, and occupational associations with low back pain. The two main categories of occupational risk are physical as well as psychosocial. There are also those

who have conducted studies but failed to prove that the duration of sitting alone did not have a significant association with the risk of low back pain. This is also related to the use of VDT (visual display terminal) which is the main tool used by office workers, because the use of VDT is also related to a person's sitting position. <sup>(2-4)</sup>

In Indonesia, epidemiological data regarding this disease do not yet exist, but according to a journal written by Putri S, patients who come with complaints of low back pain to hospitals in Indonesia range from 3-17%. The prevalence of patients experiencing low back pain at Raden Mattaher General Hospital Jambi Province also ranges from 21.2%. <sup>(5)</sup>

Vos stated that because LBP represents the third leading cause of self-perceived disability due to various diseases and according to Weis this indicates a major disease of economic burden for society, identifying risk factors, especially in an office environment, appears to be very important to implement appropriate prevention programs. <sup>(3)</sup> Therefore, researchers are interested in conducting a literature review on this matter.

## METHODOLOGY

The method used by researchers to make this literature review is to search for journals published between 2011-2020 which are available in medical databases through Google Scholar, BMJ, JOEM, and Cochrane Library. Journals will be searched using keywords: "low back pain", "risk factor", "office worker" and "VDT". These keywords will be combined to find suitable journals such as: "low back pain", "risk factor", and "VDT" (on Google Scholar) and "low back pain", "risk factor", "office worker" and "VDT" on (BMJ, JOEM, and Cochrane Library). All references from the selected journals will be re-selected to obtain appropriate results and the inclusion criteria include articles covering study designs from all levels of evidence-based medicine, articles that have been published and have undergone peer-review, the subjects studied are office workers. VDT users with an age range of 19-64 years, the languages used are Indonesian and English, articles published in 2011-2020 and the exclusion criteria include articles or journals not being available in complete manuscript form, articles in narrative form, articles in the form of consensus, then after the journals have been collected, the result of research from research journals and theories from articles, literature reviews related to risk factors for low back pain in office workers will be described. On Google Scholar selected journals that have a time span of 2011-2020. A Google Scholar search found 393 journals, from the Cochrane Library 29 journals were found, and from JOEM 8 journals were found, bringing the total number of journals to 430 journals.

## RESULT

**Table 1.** Risk Factor of Lower Back Pain in Office Workers with Video Display Terminal (VDT)

Author and Year	Title	Research design	Population	Appraisal Procedure	Results
Maryam R, et al. (2011)	Low Back Pain and Related Factors	Cross-sectional study	The total number of samples used is 1436	Using interviews and questionnaires	According to the study, age 41-50 years had an OR 2.14 (95%CI 1.03-3.01), women had an OR 1.32 (95%CI 0.80-3.54), weight >90 kg

	<i>among Iranian Office Workers</i>		office workers		had an OR 2.36 (95%CI 1.39-2.44), sitting > 8 hours had an OR 2.57 (95%CI 2.13-3.05), smoking had an OR 1.01 (95%CI 0.85-1.36), working more than 20 years had an OR 1.77 (95%CI 0.65-1.70), using a computer >6 hours had an OR 1.45 (95%CI 0.65-1.99). Smoking was found to have a p-value not below 0.05 because the subjects studied by the researchers did not all answer honestly the question of whether they smoked or not.
<b>Norashikim M, et al. (2014) Malaysia</b>	<i>Psychosocial and Ergonomics Risk Factors Related to Neck, Shoulder, and Back Complaints among Malaysia Office Workers</i>	<i>Cross-sectional study</i>	The total sample used is 630 office workers in Malaysia.	Give a questionnaire and are given a few days to fill out and return the questionnaire.	In this journal, <sup>16</sup> sitting period (sitting time) with OR 1.23 (95% CI 1.06-1.42) with p value <sup>19</sup> 0.006, time spent typing with OR 0.88 (95% CI 0.78-0.99) with p value <sup>22</sup> 0.031, overtime work with an OR 1.43 (95% CI 1.01-2.03) with a p value = 0.043 which has a relationship with back pain in office workers who use computers in their daily life. However, the journal does not include the number of hours spent sitting, typing, and working overtime.
<b>Rawit J, et al. (2012) Bangkok, Thailand</b>	<i>Risk Factors For The Onset of Nonspecific Low Back Pain in Office Workers: A Systematic Review of Prospective Cohort Studies</i>	<i>Systematic Review</i>	Not using the sample as the person being studied	Using the PubMed, <sup>3</sup> NAHL PLUS, ScienceDirect, PEDro, ProQuest, and Scopus databases from 1980 to November 2011 using the keywords: <i>low back pain or prognostic factors and office or computer or visual display unit (VDU) or visual display terminals (VDT)</i> .	After a journal search by the researcher, it was found that the previous history of LBP had an OR value of 2.4 (95% CI 1.70-3.39), low postural risk factors and high <sup>21</sup> k tension had an OR value of 2.53 (95% CI 1.09-5.85) (only for women).), high postural risk factors and low work tension have an OR value of 2.51 (95% CI 1.23-5.09) (for women only), and high postural risk factors and high work tension have an OR value of 5.51 (95% CI 2.33-13.03) (for women only).
<b>Rawda ME. (2015) Egypt.</b>	<i>Associations between Musculoskeletal Pain and Work-related Factors amongst Computer Staff</i>	<i>Cross-sectional study</i>	The total sample used is 653 office workers who directly use computers.	Using a questionnaire.	The results obtained from this study are that women have an OR value of 1.12 (95% CI 0.48-2.61), workers aged 40-49 have an OR value of 1.07 (95% CI 0.46-2.46), work experience with computers 6-15 years and 16-36 years old had OR 0.90 (95% CI 0.50-1.63) and 0.81 (95% CI 0.41-1.61), BMI values >25 had OR 1.50 (95% CI 1.24-4.24), and duration of computer use 4 -6 hours had an OR value of 2.14 (95%

## Discussion

Susanty wrote that the risk factors studied at the Hasan Sadikin Hospital, Bandung showed that the strong factors causing low back pain to occur were age, gender, BMI, smoking habits, and lack of exercise.<sup>(6)</sup>

### 1. Gender

Research conducted by Maryam R et al, showed that women had a 1.32 times risk of developing LBP compared to men. Research conducted by Rawda ME also states that women have a 1.12 times risk of developing LBP compared to men. The results of these two studies are also supported by other studies conducted by Wafa B, et al; Zulhusni D, et al; and also Mohammad A, et al stated that gender had a strong relationship with low back pain.<sup>(1.7-10)</sup>

### 2. Age

According to Susanty, age is one of the risk factors for LBP. Research conducted by Maryam R, et al stated that workers aged 41-50 years had a 2.14 times risk of developing LBP compared to other age ranges, Rawda ME also stated that workers aged 40-49 years had a 1.07 times risk of developing LBP compared to other age groups. another age range. The results of research conducted by Mohammad A, et al; support this statement. However, research conducted by Wafa B, et al; and also Zulhusni D, et al; get the results that age does not have a significant relationship with LBP in a person. However, in the discussion written by Wafa B, it was explained that indeed several other studies reported a relationship between increasing age and the incidence of LBP.<sup>(1.6-10)</sup>

### 3. Smoke

Susanty also stated that smoking has a relationship with the incidence of LBP, due to disturbances in blood circulation, including in the spine. After Maryam R conducted research, it was found that smokers had a 1.32 times risk of developing LBP compared to non-smokers. However, this figure is not significant because the p value is not less than 0.05. The results of research conducted by Fanta M, et al and Syed AA, et al also stated that people who have a history of smoking have a 5.27x higher likelihood of developing LBP compared to non-smokers.<sup>(6,8,11,12)</sup>

Researcher Zulhusni D, et al also did not find a significant relationship between smoking and LBP. However, other factors must be considered that led to this result, Maryam R, et al stated that many participants did not give honest answers when asked "do the participants smoke or use other tabako products?" and this question was denied by the participants by answering no.<sup>(1.8)</sup>

### 4. Working mass

According to the results of a study also conducted by Maryam R et al, workers who have worked for more than 20 years have a 1.77 times risk of developing LBP. The results of research conducted by Zulhusni D, et al; and Syed AA, et al; also stated that there was a significant relationship between tenure and low back pain.<sup>(1,8,12)</sup>

#### 5. Sitting Duration

Research conducted by Maryam states that workers who sit more than 8 hours a day have a 2.57 times risk of developing LBP. Norashikim M et al; also conducted a study on sitting duration, and found that the longer people sit for work, the higher the person's risk of developing low back pain. In this case, Norashikim M et al, found that the longer a worker sits, the risk is 1.23 times for LBP and the researcher states that sitting duration has a significant relationship with LBP because it has a p value of 0.006. However, the journal does not state how long the time spent sitting is. <sup>(8,13)</sup>

#### 6. Sitting Position and Work Tension

Prawit J et al conducted a study on LBP and found that workers with low sitting postural risk factors and high work tension had a 2.53 times risk of developing LBP, workers with high sitting postural risk factors and low work tension had 2.51 times the risk of getting LBP, and workers who have high postural risk factors and high work tension have a 5.51 times risk of getting LBP. Prawit concluded that the combination of postural risk factors and workload has a high risk of developing LBP. <sup>(14)</sup>

This research is supported by research conducted by Fanta M, et al; Nipaporn A, et al; and Syed AA, et al; stated that the wrong sitting position had a significant relationship with low back pain in office workers with p value = <0.05. Fanta M stated that office workers who have low awareness of good sitting posture have a 2.63x higher likelihood of developing LBP than those who have high awareness of good sitting posture. <sup>(11,12,15)</sup>

#### 7. Previous NPB History

In her journal, Susanty stated that people who have a previous history of LBP have a risk and a tendency for the disorder to occur again. This is supported by a study conducted by Prawit J et al, where people who have a history of LBP have a 2.4 times risk of developing LBP compared to those who have no previous history of LBP. <sup>(13,15)</sup>

#### 8. BMI

Susanty stated that people who are overweight have a greater risk of low back pain, because the load on the weight-bearing joints will increase. This statement is supported by several other studies, such as research conducted by Maryam R, et al where workers who weigh more than 90 kg have a 2.36 times risk of developing LBP. The results of research conducted by Rawda ME also support, where workers or individuals who have a BMI of more than 25 have a 1.50 times risk of developing LBP compared to those who do not. <sup>(6,8,9)</sup>

#### 9. Computer Usage

In the results of a study conducted by Rawda ME where the duration of computer use 4-6 hours has a 2.14 times risk of getting LBP. The results of this study are supported by research conducted by Maryam R et al. It was found that using a computer for more than 6 hours a day has a 1.45 times risk of developing LBP. Norashikim M et al also found that time spent typing correlated with LBP, found to have 0.88 times the risk of developing LBP compared to those who spent less time typing. Even in this section, the Norashikim researcher does not include how many hours are used to use the computer. <sup>(7,8,12)</sup>

10. Etc

In the results of research conducted by Norashikim M et al, it was found that working overtime has a relationship with low back pain because it has a p value = 0.043 and people who work overtime have a 1.45 times risk of developing LBP compared to those who do not. However, detailed information was not provided on how long the overtime time was used so that the NPB could occur for office workers. Research conducted by Rawda ME also found that people who work with computers for a period of 6-15 years have a 0.90 times risk of getting LBP, while those who have 16-36 years of working experience with computers have a 0.81 times risk of getting LBP. <sup>(8,12)</sup>

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## CONCLUSION

Low back pain is a very common world health problem. Daily use of VDT also puts users at high risk of developing adverse conditions related to vision, musculoskeletal system and mental health. The risk factors found to have an association with low back pain in office workers with VDT after conducting this *literature review study* were female workers, office workers with an age range of 41-50 years, smokers, workers who had worked for more than 20 years, workers who sit more than 8 hours a day, high risk factors for sitting posture, high work tension, have a previous history of LBP, have a BMI value > 25, use computers 4-6 hours a day, often work overtime and also use computers for 6 months. -15 years.

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