



EXERCISE STRETCHING AS AN INTERVENTION TO PREVENT BACK PAIN IN HOME INDUSTRY SHOES KAB. GARUT: A CASE REPORT

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ABSTRACT

Introduction: Working positions that are not in accordance with the principles of body ergonomics will cause work-related illnesses, namely complaints of back pain. Risk factors that can trigger discomfort in the back area include age, body mass index, length of work, type of work chair, sitting position, and physical activity performed. Stretching exercises can increase muscle blood circulation causing spasm and reduced ischemia so that the metabolism of materials needed by the body becomes well dispersed and processes the elimination of waste materials that are not needed by the body more efficiently. The purpose of this study is to increase knowledge about how to deal with back pain in workers.

Methods: This type of research used a qualitative study method with a total sample of 8 male workers, all workers did not know about ergonomic positions and there were 6 workers who experienced complaints of back pain.

Results: Actions that can be used to increase knowledge and reduce pain levels in workers with providing health education on ergonomic positions and stretching exercises.

Conclusion: Based on these actions, workers already know and understand about ergonomic positions that can be applied in the workplace and after doing 12 stretching exercises the workers stated that being more relaxed and comfortable between work, the felt back pain also reduced, to a scale of 2.

Keywords: *Back Pain, Stretching Exercises, Worker*

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INTRODUCTION

Occupational health safety (K3) is an effort to create a healthy and safe work environment so as to minimize the number of work-related illnesses and accidents that reduce work productivity (Sholeha & Sunaryo, 2022). Occupational accidents are the result of low knowledge, skills and readiness at work. Work accidents are caused by hazardous conditions related to work methods, work environment, types of work and production processes (Sudarman et al., 2022). Occupational accidents can be caused by environmental conditions that cause workers to become unsafe (unsafe condition) or it can be caused by dangerous worker behavior (unsafe human act) carried out by workers (Aprilliani et al., 2022).

The creation of OSH in the work environment aims to prevent accidents and work-related illnesses,

minimize the emergence of risk factors and increase productivity and quality of work (Nan Wangi, 2020). Diseases that often arise in workers with positions that last for a long time, namely musculoskeletal problems with complaints of low back pain or low back pain.

Low back pain refers to a feeling of pain or pressure between the lower ribs and in the legs. Waist discomfort caused by the position in work most of the activities are carried out in a static sitting position and repetitive movements (Arwinno, 2018)

Worldwide, there are around 183 countries that are supervised by WHO and the International Labor Organization (ILO) in terms of occupational health. In 2016, around 13.7% of them experienced pain in the back and neck due to ergonomics. According to Riskesdas (2018) The prevalence of musculoskeletal

disorders in Indonesia which has been diagnosed by health workers reaches 11.9%, while based on diagnosis or symptoms it reaches 24.7%. Although it is not known for certain, it is estimated that the number of sufferers of pain in the lower back in Indonesia ranges from 7.6% to 37% (Safitri et al., 2022).

If workers' health is in a bad status, it can hinder work, decrease work productivity and cause a decrease in quality and work motivation (Irzal, 2016). Pain in the lower back can reduce human efficiency, 50-80% of employees worldwide have experienced lower back pain, where almost one in three adults have experienced some type of pain in the lower back which is the second disease after flu which can make a person unable to work so that it has a negative impact on socio-economic conditions by reducing working days as well as reducing efficiency (Tanderi et al., 2017).

Discomfort in the lower back area or what is known as low back pain is a problem that occurs in the musculoskeletal system and is influenced by several risk factors. Several risk factors that can trigger discomfort in the lower back area include age, body mass index, length of work, type of work chair, sitting position, and physical activity performed. Discomfort in the lower back area can be experienced by both young and old people, but it gets worse at the age of 30-60 years and over (Roffey et al., 2010)

The way to prevent back pain is to apply the right position at work that is in accordance with ergonomic principles, but this needs to be supported by facilities such as adequate chairs and tables. There are several other ways to prevent complaints of back pain, one of which is by stretching the muscles in between work. This is because stretching exercises can produce a number of effects on the body such as reducing problems in the musculoskeletal system because it can increase blood circulation in the muscles causing reduced spasms and ischemia. so that the metabolism of materials needed by the body becomes well dispersed and processes the removal of remaining materials that are not needed by the body more efficiently (Raharjo & Priono, 2017).

In the results of research conducted by Prastuti et al., (2020) on craftsmen in three regions of Pekanbaru City regarding the correlation of working period and sitting position to the incidence of low back pain in craftsmen in Pekanbaru City in the percentage in a sitting position there is a 91.8% chance of experiencing pain in the lower back, during long working hours 85.1% of craftsmen have the possibility of experiencing complaints of pain in the lower back.

Home Industry Perdino Lighter is an industry that focuses on the production of women's special leather shoes located in RW 11 Kelurahan Kota Wetan, Garut Kota District, Garut Regency. The home industry was chosen as an area of occupational health and safety nursing study conducted by the author because the way of working is not in accordance with ergonomic principles and all workers have not been

exposed to information on how to prevent work-related illnesses.

Nurses within the industrial scope can work as case manager role in dealing with a work accident, clinical practitioner that focuses on preventing injury and illness, health surveyor to carry out regular health surveillance of employees, manager, regulatory professional, provide training and counseling, and maintain a code of ethics (Naufal & Wahyuni, 2022). Occupational Health Nurses (OHN) or Occupational Health Nursing (K3) is nursing care carried out by nurses in industrial or industrial environments home industry to carry out health services and prevent work accidents.

Occupational health nurses have a role to promote welfare, provide health care, and strive to prevent illness and injury in the work environment regardless of age, gender, race, culture, or ethnic background of workers regulated in the Standards of Occupational Health Care Practice from the American Association of Occupational Health Nurses (AAOHN) (Suarjana, 2022).

In nursing practice, there are several models of care that can be used, one of which is the model developed by Betty Neuman. Health Care System, which is a concept model that describes nursing activities aimed at emphasizing stress reduction by strengthening self-defense lines in a flexible or normal or resistant manner with one of the service targets being the community. The Neuman model system was developed using general theory and views the client as an open system that responds to triggering factors and the environment (Luthfa & Windani, 2015).

METHODS

This type of research uses a qualitative study method with a total sample of 8 workers. Data collection techniques are carried out by windshield survey and interviews with workers and home industry owners. The instruments used for the interview process are instruments that have been prepared and adapted to the current conditions of the home industry. The nursing care model used in case report the nursing care model Health care system neuman which is used to help determine community nursing interventions based on diagnoses that have been compiled and focuses on primary prevention by conducting stretching exercise education.

RESULTS

The condition of the shoe production site is in a densely populated area. At first, the building was not to function as a home industry but as a rental. However, due to several reasons, in the end, approximately 4 of the two-floor rented buildings were used as shoe production sites. With the reason that the initial development was not functioned as an industrial place, the building is quite narrow with very limited ventilation area <10% of the ideal area of

an industrial building. Based on the results of observations, the condition of the floor looked very dirty, there were lots of shoe glue marks stuck to the floor, and pieces of leather were scattered. However, in terms of environmental sanitation, the building is equipped with 4 toilets and a source of clean water. When indoors it will be very hot due to insufficient ventilation.

Based on the interview results, there were 8 workers who were all male where almost the majority of workers experienced back and neck pain due to working in a sitting position for quite a long time.

In the Perdino lighter home industry, workers are adjusted according to their respective skills, there are 3 working processes, namely material cutting, sewing and gluing. All of the work is done in a sitting position, in one day all workers can sit statically in the same position for up to one to 2 hours. In addition, occasionally workers who are in the process of cutting or gluing lift goods weighing less than 10 kg using their bare hands without any tools. This is one of the factors that can cause back pain.

Home industry workers and owners stated that they did not know about the importance of ergonomic positions when working because basically there had never been any health education or counseling about this problem. Based on the results of the assessment using the occupational health assessment instrument, it was found that the types of activities carried out by workers during 1 working day were all activities carried out in a sitting position which could last more than 2 hours. In addition, the results of the physical examination of workers found that there were 3 workers who had normal blood pressure, 3 had hypertension, and 2 had stage 1 hypertension. In more detail, the results of the physical examination of workers are attached in table 1.

Table 1 Study Results.

| Demographics | N | Presentase (%) |
|---------------------------------------|---|----------------|
| Age | | |
| ≤ 16 years old | 0 | 0% |
| 17- 25 years | 3 | 37.5% |
| 26-35 years | 4 | 50% |
| 36-45 years | 1 | 12.5% |
| 47-56 years | 0 | 0 |
| ≥ 56 years | 0 | 0% |
| Gender | | |
| Man | 8 | 100.0% |
| Woman | 0 | 0% |
| Length of work | | |
| <1 year | 3 | 37.5% |
| 1-5 years | 4 | 50% |
| >5 years | 1 | 12.5% |
| Physical Conditions of Workers | | |

| | | |
|--|---|--------|
| Worker's blood pressure | | |
| Normal | 3 | 37.5% |
| Pre-Hypertension | 3 | 37.5% |
| Grade 1 hypertension | 2 | 25% |
| Grade 2 hypertension | 0 | 0% |
| Had an illness before work | | |
| No | 8 | 100.0% |
| Kind of sick before work | | |
| There isn't any | 8 | 100.0% |
| Pain during work | | |
| Of | 8 | 100.0% |
| No | 0 | 0% |
| Kind of pain during work | | |
| Painless | 0 | 0 |
| Headache and dizziness | 7 | 87% |
| Fever | 1 | 13% |
| Cough | 0 | 0% |
| Joint and Back Pain | 6 | 75% |
| Been sick for a long time at work | | |
| Painless | | |
| Rarely (less than 3 times a month) | 5 | 62.5% |
| Sometimes (3-5 times a month) | 3 | 37.5% |
| Often (more than 5 times a month) | 0 | 0% |
| Smoking at work | | |
| Of | 7 | 87.5% |
| No | 1 | 12.5% |
| It takes energy to lift things | | |
| Of | 3 | 37,5% |
| No | 5 | 62,5% |
| The weight of the object being lifted | | |
| There isn't any | 5 | 62.5% |
| <10 Kg | 3 | 37.5% |
| >10 Kg | 0 | 0% |
| >20 Kg | 0 | 0% |
| How to lift things | | |
| Raised at shoulder level | 3 | 37.5% |
| Raised at the elbow | 0 | 0% |
| Raised at the level of the calf | 0 | 0% |
| No Once lift thing | 5 | 62.5% |
| Working hours in a week | | |
| 6 days | 8 | 100% |
| Working hours in a day | | |

| | | |
|--------------------------------|---|--------|
| >8 hours | 8 | 100% |
| Take breaks during work | | |
| 1-2 hours | 8 | 100.0% |
| Activities during work | | |
| Cutting | 2 | 25% |
| Sewing | 2 | 25% |
| Gluing | 4 | 50% |
| Position at work | | |
| Sit Often | 8 | 100.0% |
| Long working position | | |
| >2 hours | 8 | 100.0% |

Nursing diagnoses raised from the results of work health and safety studies that have been carried out are ineffective health management b.d lack of exposure to information d.d workers and home industry owners do not know ergonomic positions and how to do stretching exercises, 6 people complain of back pain, pain scale 3.

Ineffective health management is a pattern of regulation and integration and handling of health problems into unsatisfactory habits of daily life to achieve the expected health status. This is in accordance with the conditions of workers in the home industry where the pattern of regulation, integration and treatment of perceived back pain is considered ineffective so that the health status of workers is not achieved properly. Lack of exposure to information which is the etiology or cause of the main nursing problem in this case is the lack or absence of information related to the problem or stressor. Home industry workers and owners do not have good information or knowledge about how to do stretching exercises to treat back pain. This happens because workers and home industry owners are not exposed to information.

Based on the issues that have been raised, The intervention was carried out by providing education and demonstrations regarding stretching exercises with 12 movements consisting of back extension, neck forward, neck left and right, shoulder over, shoulder across, shoulder back, bridge stretch, forearm and wrist, hamstring stretch, calf stretch, quad and flexor stretch. In addition, health checks were carried out in the form of measuring the blood pressure of owners and home industry workers. One way that is considered suitable to prevent an increase in complaints of low back pain is through stretching exercises or stretching, an administrative measure to reduce ergonomic hazards in the workplace. The principle of this training is to equip employees with the knowledge and skills to prevent back pain and improve joint flexibility.

The results of blood pressure measurements on workers and home industry owners showed that 3 workers had pre-hypertension and 2 workers had grade 1 hypertension, while the other 3 workers had

normal blood pressure. After conducting health education regarding ergonomic positions at work, the owner and employees expressed their understanding and demonstrated a stretching exercise which consisted of 12 movements the workers could practice and stated that by doing stretching exercises the body becomes more relaxed and comfortable.

DISCUSSION

Based on the results of the study, there were 8 male employees aged 26-55. Of all the workers, 6 of them complained of headaches, dizziness, joint pain or back pain, 1 other only complained of dizziness with a history of fever 1 week ago. This problem is rarely felt by 5 in a month less than 3 times, while the other 3 workers feel complaints 3-5 times in one month. To overcome this problem, workers are used to only consuming over-the-counter medicines.

Most of the workers have a habit of smoking in the workplace as many as 7 people and all of them consume 2 cups of coffee/day. Smoking can increase carbon monoxide which can cause red blood cells to contain more carbon monoxide than oxygen so that the supply of oxygen to the brain is reduced, this is considered a trigger for headaches in active or passive smokers (Benemei et al., 2013). In addition, cigarettes contain nicotine which can stimulate vasoconstriction in the blood vessels in the head, causing headaches and nicotine will enter the bloodstream increasing the production of the hormone adrenaline causing an increase in blood pressure, heart rate and respiratory rate. (Benemei et al., 2013; Indonesian Ministry of Health, 2022).

The activities carried out while working were cutting shoe material, sewing and gluing in a sitting position, the 2 workers in charge of sewing almost spent quite a long time in a sitting and bending position, while workers in the cutting and gluing section sat with a chair without any backrest. So that it can cause a mismatch of working position with ergonomic principles. Improper sitting posture can cause the muscles of the waist to continuously contract to maintain body balance. After a while in one position, the lower back muscles get tired and cause mild pain in the back. To reduce these complaints, the head should be kept upright when sitting so as not to increase the burden on the muscles of the waist which maintain body balance (Kusumaningrum et al., 2021).

This is supported by research showing that chairs and tables can reduce discomfort by 65.35% and increase worker productivity by 77.13% compared to traditional working postures. Therefore, the use of chairs and tables greatly affects the comfort and productivity of the Padang Pariaman melinjo chip maker.

All workers or as many as 8 people spend more time working in a sitting position compared to a standing position with a sitting time of more than 2 hours. This can cause workers to be at high risk of experiencing an incident low back pain. Workers who sit in an improper position and for a long period of

time can cause the muscles to become stiff and the posterior longitudinal ligament in the spine to stretch (Wardoyo et al., 2021). The wrong sitting position can cause abnormal pressure on the tissues, resulting in pain in the lower back (Irsadioni et al., 2018). In a sitting position, the muscles that are active are the back and abdominal muscles that balance the spinal erector muscles. Maintaining the same body position for 90-300 minutes has been shown to be a factor that increases the risk of developing pain in the lower back (Yue et al., 2012).

Workers who carry out their duties in a sitting position can experience weakness in the abdominal and back muscles and increased pressure on the spine (Alfaridah & Febriyanto, 2022). Factors that can influence the emergence of complaints of low back pain are sitting position at work, duration of work, body mass index, work pressure, and exercise habits (Wahyu & Hakim, 2022). According to research conducted by Kusuma et al., (2014) non-ergonomic work postures affect the incidence of low back pain in Shoe Village workers.

Apart from working in a long sitting position, 3 (37.5%) workers in the home industry also lift loads in the form of raw materials used for production purposes weighing <10 kg, causing joint pain and back pain. This is in accordance with research conducted in America which states that as many as 60% of workers experience back pain due to doing work such as lifting weights without using tools.

Things that can be done to reduce the incidence of back pain in workers who lift weights are by paying attention to the ergonomic position when lifting weights and placing loads and stretching exercises using static movements so that they can relax the muscles used for strength in lifting weights.

The results of examination of vital signs for the owner and workers found that 3 workers had Pre-Hypertension and 2 people had Stage 1 Hypertension. All workers admitted that they had never come to the health facility to check their health condition and only found out they had hypertension during the visit and blood pressure check in home industry.

The duration at work can be one of the factors that can affect the health of workers. In the Perdino Lighter home industry, the time spent working for one week is 6 days, with working hours of approximately 10 hours per day. The employee said that the working hours are flexible because the wage system is a piece rate according to the shoes completed by each person. The duration of a person at work ideally is 6-8 hours a day, the remaining 16-18 hours is used for life with family, community, sleeping breaks and others (Ramadani, 2021). If a person works more hours than this ability, it causes a decrease in productivity, is inefficient and tends to cause fatigue, illness and work accidents (Maulina & Syafitri, 2019).

Improper working postures and working conditions can eventually cause disorders such as disorders of the musculoskeletal system musculoskeletal disorder (MSDs). MSDs are pain that

occurs in the muscles, tendons and nerves. This can cause discomfort, muscle fatigue and can damage tissue (World Health Organization, 2022). This position causes a heavy postural load, when it occurs over a long period of time it creates a distortion of postural tension, which is mechanical tension in the muscles, thereby reducing blood flow to the muscles and disturbing the chemical balance. This can lead to a decrease in labor productivity.

Types of MSD that are common in home industry workers include low back pain. Low back pain (LBP) is pain that occurs acutely or chronically that occurs in the spine in the lumbosacral area, upper and plantar legs that occurs due to the process of thinning of the intervertebral disks. LBP often occurs in workers who sit too long and often lift weights (Prahastuti et al., 2021).

This is in accordance with the data obtained from the results of a survey of home industry workers. As many as 8 (100%) workers stated that the position used at work was a sitting position with a duration of >2 hours a day. As many as 6 (75%) workers need energy to lift goods weighing <10 kg as many as 3 (37.5%) workers by lifting objects parallel to the shoulders. As a result of this habit, as many as 6 (75%) workers experience complaints of joint and back pain while working.

The existence of these complaints can lead to reduced work productivity and decreased ability to work. Based on this, the application of the Betty Neuman system model can be used as a nursing intervention that can be used. This system model is a general system that reflects living things as open systems that interact with each other (Hitiyaut & Hatuwe, 2022).

The purpose of carrying out nursing actions is based on model health care system namely to stabilize the system owned by the client, so that it can be achieved through nursing actions or interventions to reduce stress that occurs or is felt. The concept of the Betty Neuman system model, one of which focuses on three levels of prevention. This prevention consists of primary, secondary and tertiary prevention (Hitiyaut & Hatuwe, 2022). In this case, the prevention used as an intervention or action given to home industry workers is primary prevention by promoting or educating health about how to do stretching exercises between work (Hitiyaut & Hatuwe, 2022).

Primary prevention that can be done is by providing health education education and demonstrations about stretching exercises (stretching) to be done on the sidelines of work as an intervention used to reduce back pain (Astuti & Koesyanto, 2016). This action is included in primary prevention because providing education about stretching exercises can reduce the risk and complaints of back pain due to the impact of sitting static for more than two hours (Okananto et al., 2014).

At the primary prevention level, health workers are involved in health promotion and disease prevention. Provision of health education is a process

of increasing awareness that can influence attitudes and individual behavior to achieve optimal physical, mental and social health. Preventing disease in the workplace begins with increasing worker knowledge in recognizing occupational health risks or hazards that result in health problems and disease (Permatasari, 2015).

The response of a person, family or community to an illness depends on the knowledge, attitudes and actions of each individual. If one's knowledge about the disease is unknown or unformed, attitudes and preventive measures are sometimes ignored (Notoatmodjo, 2005).

The stretch in question is stretching using muscle strength and ability. The purpose of doing this stretching exercise is to reduce the risk of bone and muscle injuries and reduce and prevent their occurrence low back pain in home industry workers.

Stretching exercises (stretching) which is performed on workers in the home industry consists of 12 movements, which consist of movements of the hands, legs, neck, back and shoulders. The 12 movements consist of: back extension, neck forward, neck left and right, shoulder over, shoulder across, shoulder back, bridge stretch, hamstring stretch, calf stretch, quad and flexor stretch, forearm and wrist.

This muscle stretch can be done with a duration of approximately 5 minutes without moving from the place or starting position to work. Muscle stretching can produce a number of effects on the body such as reducing problems in the musculoskeletal system because it can increase blood circulation to the muscles causing spasm and reduced ischemia so that the metabolism of materials needed by the body becomes well dispersed and processes the elimination of waste materials that are not needed by the body. the body becomes more efficient (Raharjo & Priono, 2017). In addition, increased blood flow to the muscles thereby increasing the input of nutrients and oxygen to the muscles and spine (Atika Rahmawati, 2021).

CONCLUSION

After providing education regarding stretching exercises and demonstration of 12 stretching movements for workers and home industry owners, they stated that they already knew and understood about ergonomic positions that could be applied in the workplace and after carrying out 12 stretching exercises the workers stated that they became more relaxed and comfortable on the sidelines of work, the back pain that is felt is also reduced, to a scale of 2.

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