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Mapping of potential work-related musculoskeletal disorders in Junrejo community health center

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ABSTRACT

The International Labor Organization states that controlling work-related musculoskeletal disorders (WMSDs) is part of the Sustainable Development Goals (SDGs) program to protect labour rights and promote a work environment according to the concept of Ergonomic Function Deployment (EFD). This study aims to map the potential for WMSDs in the Junrejo Community Health Center environment. The study used the Nordic Body Map (NBM) questionnaire presented using data triangulation. The NBM results showed an average score of 32.54. This value informs that workers in the Junrejo community health centre environment have a low risk of WMSDs or do not yet need priority action.

Kata Kunci
Ergonomi
Gangguan muskuloskeletal
Nordic body map
Penyakit akibat kerja
Postur janggal

Pemetaan potensi gangguan muskuloskeletal akibat pekerjaan di Puskesmas Junrejo. Organisasi Ketenagakerjaan Internasional menyatakan bahwa pengendalian gangguan muskuloskeletal terkait pekerjaan merupakan bagian dari program pembangunan berkelanjutan untuk melindungi hak-hak tenaga kerja dan mempromosikan lingkungan kerja yang sesuai dengan konsep Ergonomic Function Deployment (EFD). Penelitian ini bertujuan untuk memetakan potensi gangguan muskuloskeletal yang dikarenakan pekerjaan di lingkungan Puskesmas Junrejo. Penelitian ini menggunakan kuesioner Nordic Body Map (NBM) yang disajikan dengan menggunakan triangulasi data. Hasil NBM menunjukkan nilai rata-rata sebesar 32,54. Nilai tersebut menginformasikan bahwa pekerja di lingkungan Puskesmas Junrejo memiliki risiko gangguan muskuloskeletal akibat pekerjaan yang rendah atau belum memerlukan tindakan prioritas.

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INTRODUCTION

The application of risk analysis measures for the potential occurrence of work-related musculoskeletal disorders (WMSDs) is an effort to protect workers through controls that meet the standard. These controls are expected to create working conditions that are safe and comfortable and have an impact on increasing productivity. Achievement and implementation are based on ergonomic factors related to workers and workstations (Jacquier-Bret & Gorce, 2023). Ergonomics is a study of the work environment, work equipment, and humans and the relationship between them to achieve a level of efficiency, welfare, and safety in carrying out work activities to create a comfortable atmosphere that

can support work productivity. Static and repetitive work activities for a long time cause disturbances in the movement components, namely joints, ligaments, and tendons (Mendonça et al., 2018). However, these disorders are primarily influenced by ergonomic positions, mismatches between workstations and workers, and excessive muscle loading. This position can cause complaints commonly called work-related musculoskeletal disorders (WMSDs) (Heidari et al., 2019).

Musculoskeletal disorders are a health problem for workers in various fields of work (Jacquier-Bret & Gorce, 2023). The International Labor Organization (ILO) states that controlling WMSDs is part of the Sustainable Development Goals (SDGs) program (International Labour Organization, 2014). The program is described in point 8.8 to protect labour rights and promote a safe and secure working environment for all workers (Bappenas, 2019). Meanwhile, the World Health Organization (WHO) and the Global Burden of Disease state that as many as 1.71 billion workers in the world experience WMSDs. Half of the prevalence, namely 568 million workers, experience WMSDs specific to low back pain (LBP). The prevalence of WMSDs in Indonesia in general is 36.6%. Meanwhile, several provinces in Indonesia have a prevalence of joint disease above the national percentage (Susilo, 2022). These provinces include Nanggroe Aceh Darussalam, West Sumatra, Bengkulu, West Java, Central Java, East Java, Bali, West Nusa Tenggara, East Nusa Tenggara, South Kalimantan, and Papua. In general, the incidence of WMSDs is a major contributor in causing worker disability due to occupational diseases and/or occupational accidents to early retirement from work. So mapping every employee complaint can be an initial screening to reduce the prevalence of WMSDs (Aprianto et al., 2021).

The incidence of WMSDs based on reports from the WHO and the Indonesian Ministry of Health and partners was confirmed using Nordic Body Map (NBM). The findings of specific and concrete WMSD problems that are the priority problems are in the neck, hand wrist, and back muscle regions of 27 maps of right or left side body parts (Heidari et al., 2019). The results of previous research indicate that health professionals have the potential to experience WMSDs. The prevalence of WMSDs occurs in the back, neck, shoulder, and wrist regions. However, each profession has specific regions that are likely to experience WMSDs. Dentists and surgeons have 35-55% potential to experience WMSDs in the upper limbs, nurses have >25% potential in the lower limbs, and the rest occur in other professions. In order, professions with high potential for WMSDs include dentists, surgeons, midwives, physiotherapists, nurses, and osteopaths (Jacquier-Bret & Gorce, 2023). The magnitude of the potential is influenced by awkward position factors and work duration (Putsa et al., 2022).

The work duration at Community Health Center reaches 6 hours per day. When associated with the provisions of Article 77 paragraph 1, No. 13 of 2003 concerning working hours that apply is 7 hours per day and 40 hours in 1 week the work duration is by applicable regulations. However, WMSD events that arise are generally associated with work activities that are awkward positions (International Labour Organization, 2014; Susilo, 2022). However, do healthcare professionals in the types of hospitals, clinics and health centers have the same potential for WMSDs. Whereas this community service focuses on services at the first level, namely health centers. Systematically, WMSD problems found through the NBM method approach are carried out with a management action plan. So, this community service aims to map the potential of WMSD in the Junrejo Health Center environment. The form of management efforts uses the presentation or socialization method and provides activity reports to the section responsible for the administration system, problem solving and control of health resources at Junrejo Community Health Center of Batu City.

METHOD

Procedur of study populations

Community service was carried out in the work environment of the Community Health Center on Jl. Pronoyudo No.30, Dadaprejo, Junrejo, Batu City, East Java 65233. This service has obtained permission from the public health office of the Batu city with number 072/1371/422.107/2022. The service aims to map the potential for WMSDs in health employees caused by professional professional activities. The implementation of the service consists of the problem observation stage, problem confirmation and analysis, as well as report preparation and education. The observation stage includes licensing activities and interviews with the person in charge of controlling employee health resources. Then mapping WMSDs using the NBM questionnaire on 15 employees is determined using a cluster random sampling approach in a natural setting (Mushlih & Rosyidah, 2020). The results of the mapping were analyzed through data triangulation techniques. The last step was to educate employees to reduce the risk of WMSDs through the scientific approach of physiotherapy. The ability of employees to make efforts to prevent WMSDs through modification of work activities is the main indicator of this service. These indicators include the ability to analyze awkward positions and be able to carry out the WMSDs rehabilitation in accordance with the recommendations of the ergonomics guidelines from the Indonesian Ergonomics Association (PEI) (Yassierli et al., 2020).

Data collections

The Nordic body map (NBM) or standard Nordic questionnaire (SNQ) is a self-report questionnaire to determine pain complaints in 27 body parts. These complaints are one of the signs to identify the risk of musculoskeletal disorders (MSDs). The level of discomfort or pain complaints on the NBM includes No Pain (1), Slightly Pain (2), Pain (3), and Very Pain (4). In order, these scores represent no pain in a certain area, slight pain in a certain area, discomfort, and very pain in a certain area. All self-reports were calculated to total individual scores to determine the risk classification of WMSDs. The

classification consists of low (28-49) indicating no need for action, medium (50-70) requiring future action, high (71-90) requiring immediate action, and very high (92-122) requiring comprehensive corrective action as soon as possible (Heidari et al., 2019; Prastowo et al., 2023).

RESULTS AND DISCUSSION

The results of mapping the characteristics of employee respondents at Junrejo Community Health Center of Batu City are dominated by female employees in the late adult to early elderly age range, both of which reach 72%. All employees have a daily work duration of no more than 6 hours. Employee professions are dominated by midwives and nurses until each profession reaches a percentage of 20%. Both professions show awkward positions with dynamic work activities.

Table 1. Characteristics of respondents

Characteristics	Frequency (n)	Percentage (%)
Gender		
Male	6	40
Female	9	60
Age		
Late Adolescent (17-25 Years)	1	7
Early Adulthood (26-35 Years)	3	21
Late Adults (36-45 Years)	5	36
Early Elderly (46-55 Years)	5	36
Profession		
Doctor	1	7
Nurse	3	20
Dental Nurse	1	7
Midwife	3	20
Pharmacist	1	7
Nutritionist	1	7
Laboratory Analyst	1	6
Environmental Health	1	6
Health Promotion	1	7
Medical Records	1	6
Administration	1	7
Work Activity		
Static	8	53
Dynamic	7	47
Work Position		
Nature Position	7	47
Awkward Position	8	53

Self-report of Junrejo Community Health Center employees using NMB shows an average total individual score of 32.54. This value is included in the low risk level category or no priority action is needed. However, the highest individual total score is shown in the early to late adult age category which respectively reaches 33.7 and 32. Meanwhile, based on mapping anatomical regions from 28 parts, 6 regions often complain of MSDs. These regions include the neck which reaches 23%, the back and hands at 18%, the legs at 15%, and the shoulders and waist reach 13%. Based on the Likert scale, the average complaint is mildly painful to painful. Each employee reported WMSD complaints of 3 to 8 regions (Figure 1). The WMSD complaints generally came from the maternal and child health workspace and the program. The results of workstation analysis by adopting the principles of job safety analysis (JSA) obtained several risk factors (Albrechtsen et al., 2019).

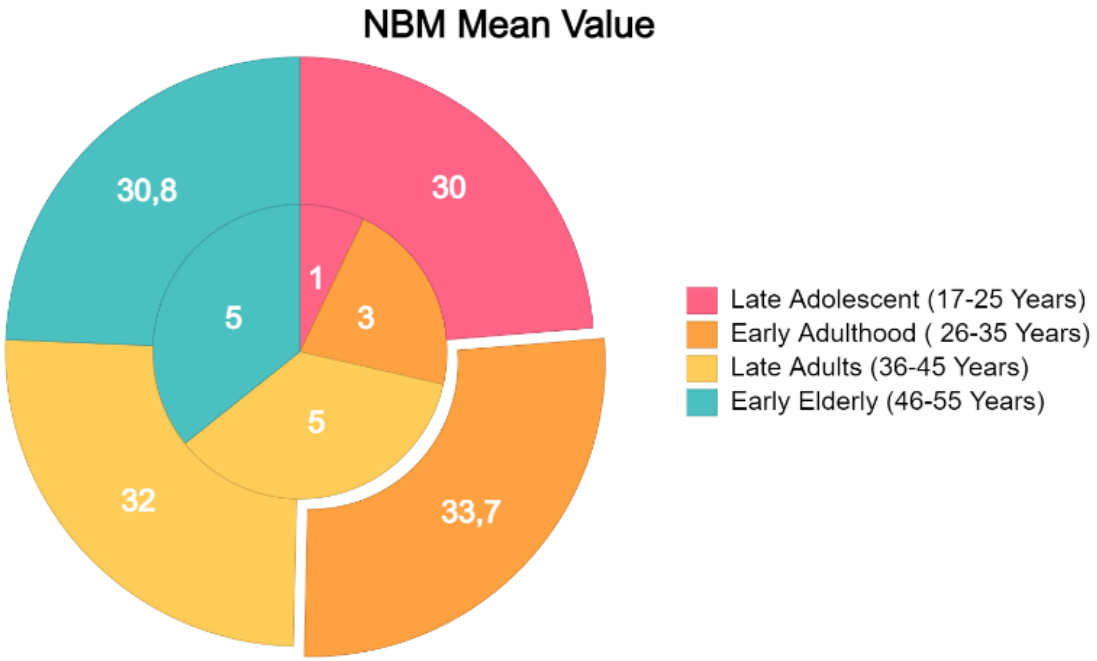

Figure 1. NBM mean value

Each workspace has different risk factors according to professional work activities (Aprianto et al., 2021). Program, service, laboratory, consultation and general poly rooms have static sitting work activities for a relatively long period of time. In addition, this is exacerbated by the condition of the placement of equipment that is difficult to reach. Such activities as in the dental, maternal and child health or maternity rooms are static standing for a period of time according to the level of complexity of the action (Figure 2). All of these activities are carried out for more than 2 hours in a row (Fauzia et al., 2023).

Figure 2. Worker's awkward position

The complexity of health worker competencies requires alignment between competency guidelines and job mobility. The identification of complexity in developed or developing countries shows the low level of compliance of health workers in understanding and developing competency guidelines. Conceptually, every health worker profession has ideal work guidelines. However, the implementation process is different. This is influenced by practice complexity factors or patient-centred demands (Batt et al., 2020). Each professional organization has developed work mobility guidelines based on ergonomic concepts. Mobility guidelines aim to improve efficiency, health, safety, comfort and convenience for each individual. Behaviours that ignore ergonomics will cause inefficiency and lead to occupational diseases and/or occupational accidents (Mohammad et al., 2019).

The incidence of WMSDs is influenced by biomechanical, psychosocial and individual factors. Biomechanical factors are closely related to work activities, work tools and work intensity. Then the individual factors include anatomical structure, age, gender, body mass index and daily lifestyle. Meanwhile, psychological factors consist of management, supervisors, emotions, communication and relationships between work environments (Chowdhury & Chakraborty, 2017). In 2021 the provinces of Aceh, Bengkulu and Bali were reported to have the highest prevalence of WMSDs. The high prevalence rate of WMSDs in Indonesia is caused by individual and biomechanical factors (Aprianto et al., 2021).

Individual factors have a significant relationship with WMSD complaints. NBM mapping of midwives at the Lebak Regency Health Centre shows complaints in the neck, shoulder and back areas. These complaints are due to the midwife's work activities at the time. The kala activity is dominated by the position of the neck bowing, and continuous rotation of the shoulders and back accompanied by wrist bending. However, these activities can change according to the birth process of the baby. In the final stage of labour, there is a relatively long process of stitching the perineum carefully and statically (Mohammad et al., 2019; Sutianingsih & Rokayah, 2019).

The completeness of equipment and the high number of patient visits are problematic at the health centre. Previous studies have shown that patient service in health centres is directly proportional to the level of work activity of health workers. The high activity occurs at workstations that require a level of accuracy such as administration, maternity and dental treatment rooms. Dentists at the Malang City Health Center reported as many as 71.42% working more than 8 hours every day. This work duration has the potential to cause WMSDs to reach a high risk of 57.14% (Murtiwardhani & Shoumi, 2020). The work only has complete equipment reaching 74.2% (Fauzia et al., 2023; Wulandari et al., 2021).

Health centre with 100% equipment completeness in Indonesia still has a relatively low risk of WMSDs. This situation is influenced by the lack of employee awareness in applying the principles of effective, comfortable, safe, healthy, and efficient (ENASE) (Jacquier-Bret & Gorce, 2023). The comfortable position performed by the average employee is included in the awkward position category (Mohammad et al., 2019). The low understanding of ENASE also occurred in 300 health workers in Iran, which resulted in the need to control WMSDs. Recommendations for WMSD prevention programs can be carried out by enforcing continuous reductions in working hours (Heidari et al., 2019). However, this study uses an action plan through Dale's Cone of Experience concept. The concept incorporates several theories related to instructional design and the learning process. The ENASE delivery design follows the read approach in the form of leaflets delivered using the simulation model. Both approaches are expected to enable health workers to remember and understand the principles of ENASE with a percentage reaching 90% (Davis & Summers, 2015).

Static work activities accompanied by awkward positions lead to high-performance stress on soft and connective tissues. Pressure is closely related to the ability of these tissues to maintain position for a relatively long time. Activities that reach the soft tissue threshold will trigger a decrease in blood circulation. This process is known as ischemia. Ischemic events cause inhibition of the transfer or exchange of O_2 in the blood. The inhibition of the exchange process results in the accumulation of CO_2, and secretions. Metabolic waste substances such as lactic acid produced from red blood cells should be distributed to various parts of the soft tissue. However, the process accumulates in certain parts to produce symptoms of MSDs (Thomas et al., 2018).

CONCLUSION

Junrejo Community Health Center employees have the potential to experience low-risk level WMSDs so no priority action is needed. The risk is influenced by static activities with awkward positions for a relatively long period. Average WMSD complaints occur in the neck, back, hands, feet, shoulders and waist regions. The complaints include mild pain to pain. The workstations that have the highest potential to cause WMSDs are the maternal and child health room and the program. The risk of WMSDs with a low category is a parameter in controlling occupational diseases or accidents due to work. Control can be done by applying ergonomic guidelines from the Indonesian Ergonomics Association (PEI). The guidelines explain work positioning, muscle stretching, and organizing workstations.

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