FOOT ORTHOSIS KUSTOM PADA GANGGUAN MUSKULOSKELETAL PADA PEKERJA KEAMANAN

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ABSTRAK

Background: Gangguan muskuloskeletal (GMS) adalah cedera yang mempengaruhi pergerakan sistem muskuloskeletal tubuh manusia. Pekerja supermarket rentan mengalami GMS karena tugas mereka yang melibatkan penanganan material secara manual. (Syafiq Darul Ridzuan & Joan Bernard, 2022). WRMSD (Work-Related Musculoskeletal Disorders) merupakan kontributor terbesar terhadap beban penyakit pekerjaan dan sebagian besar berkaitan dengan faktor ergonomi di tempat kerja (Akodu & Ashalejo, 2019). Organisasi Kesehatan Dunia (WHO) melaporkan bahwa kondisi muskuloskeletal adalah penyebab paling umum dari kecacatan dan keterbatasan dalam aktivitas sehari-hari serta pekerjaan yang menguntungkan. Gangguan muskuloskeletal (GMS) dibagi menjadi gangguan spesifik dan non-spesifik. Gangguan muskuloskeletal spesifik memiliki ciri klinis yang jelas, sementara gangguan muskuloskeletal non-spesifik menimbulkan rasa sakit tanpa bukti gangguan spesifik yang jelas (Krishnan et al., 2021).
Objective: Untuk mengetahui perubahan skor rasa sakit dengan menggunakan Nordic Body Map sebelum intervensi (baseline) dan setelah intervensi Custom Foot Orthosis selama 4 minggu, serta evaluasi dilakukan setelah 2 minggu.
Metode: Penelitian ini dilakukan dengan desain kuasi-eksperimental pretest–posttest; peserta dibagi menjadi kelompok eksperimen dan kontrol.
Results: Keluhan muskuloskeletal pada pekerja keamanan sebelum perlakuan adalah 64,07, sementara setelah perlakuan adalah 50,67. Dapat dilihat bahwa rata-rata nilai keluhan muskuloskeletal menunjukkan penurunan rasa sakit sebesar 13,40 dengan nilai signifikansi 0,000 ($p < 0,05$) di mana keluhan yang paling berat terdapat pada ekstremitas bawah.
Conclusion: Penggunaan foot orthosis kustom berpengaruh terhadap pengurangan rasa sakit pada Gangguan Muskuloskeletal.

Keywords: Gangguan Muskuloskeletal, Foot Orthosis.
References:

FOOT ORTHOSIS CUSTOM ON MUSKULOSKELETAL DISORDERS IN SECURITY

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ABSTRACT

Background: *Musculoskeletal disorders (MSDs) are injuries that affect the movement of the human body's musculoskeletal system. Supermarket workers are prone to developing MSDs due to their tasks of manually handling material. (Syafiq Darul Ridzuan & Joan Bernard, 2022). WRMSDs are the largest contributors to the occupational disease burden and are largely related to ergonomic factors found in the workplace (Akodu & Ashalejo, 2019). The World Health Organization (WHO) reported that musculoskeletal conditions are the most common causes of disability and limitation related to daily living and gainful employment. Musculoskeletal disorders (MSDs) are further classified as specific or non-specific disorders. Specific musculoskeletal disorders have clear clinical features, whereas non-specific musculoskeletal disorders present with pain without evidence of a clear-specific disorder (Krishnan et al., 2021).*

Objective: *To determine changes in pain scores with the Nordic Body Map before the intervention (baseline) and after the Custom Foot Orthosis intervention for 4 weeks and an evaluation was carried out after 2 weeks.*

Metode*: The study was conducted by using a quasi-experimental pretest–posttest design; participants were divided into experimental and control groups.*

Results: *Musculoskeletal security complaints before treatment were 64.07 while after treatment was 50.67. It can be seen that the average value of musculoskeletal security complaints showed a decrease in pain of 13.40 with a significance value of 0.000 (p <0.05) where the most severe complaints were in the lower extremities.*

Conclusion: *The use of custom foot orthosis affects reducing pain in Musculoskeletal Diseases.*

Keywords: *Musculoskeletal disorder, Foot Orthosis.*

References:

INTRODUCTION

Musculoskeletal disorders (MSDs) are injuries that affect the movement of the human body's musculoskeletal system. Supermarket workers, who handle material manually, are prone to developing MSDs.

The World Health Organization (WHO) in 2021 stated that around 1.71 billion people experience Musculoskeletal Disorders worldwide. Among Musculoskeletal disorders, lower back pain causes the highest number with a prevalence of 568 million people (WHO)(Gleadhill et al., 2021).

Based on Riskesdas data in 2018, the prevalence of Musculoskeletal diseases in Indonesia is 7.9%. The highest prevalence based on diagnosis is in Aceh (13.3%) then Bengkulu (10.5%) and Bali (8.5%) (Riskesdas, 2018). Occupational risk factors include aspects such as posture, workload level, frequency and duration of work. While individual characteristic factors involve elements such as length of service, age of workers, smoking habits, gender, stress levels, history of Musculoskeletal Disorders (MSDs) and Body Mass Index (BMI). Environmental risk factors involve elements such as vibration, lighting, noise, cold stress and heat stress (Kattang et al., 2018).

The purpose of this study was to determine the effect of the use of custom foot orthosis on Musculoskeletal Diseases in security policies that were remade in Surakarta. Updating knowledge in the field of orthotic prosthetics, especially about the use of custom foot orthosis on Musculoskeletal Diseases

Foot orthoses are among the most commonly used external supports to treat musculoskeletal disorders.

Custom Insole Insole is the inner layer of the shoe that provides comfort and supports the bottom of the shoe sole. Insoles are widely used worldwide in various shapes, sizes, and feet. The function of the insole is to dampen and absorb sweat on the feet due to walking or running activities. The insole can be easily removed and replaced with another insole. Many types of shoes use insoles, such as sneakers, formal shoes, sports shoes, and boots. (Khadijah et al., 2018)

Custom insole foot orthoses can relieve symptoms of medial tibial stress and significantly reduce pain in the lower extremities. They also reduce symptoms of low back pain and plantar fasciitis. The arch support structure not only reduces pressure on the heel but also optimizes the pressure of metatarsals 2–4 when the foot touches the ground while walking, offering

potential benefits for your foot health. (Huang et al., 2020).

MATERIALS AND METHOD

Pre-experimental quantitative research with pretest – post-test design method. By conducting measurements using Nordic before the measurement (baseline) and getting intervention for 4 weeks by evaluating after 2 weeks. The sampling technique used is purposive sampling, which applies the inclusion and exclusion criteria according to research needs. The inclusion criteria in the study are (1) male/female security guards aged 20-40 years. (2) working approximately 3-6 hours a day with a more dominant standing position (3) willing to be research respondents. Exclusion criteria are: (1) wearing heels more than 4 cm when working (2) not willing to be respondents in the study.

The researcher explained the methods, benefits, and objectives of the study to respondents who met the inclusion criteria. After obtaining approval to participate in the study, respondents were asked to fill out a questionnaire consisting of a questionnaire on respondent characteristics and health history. Then explained the research procedure and measurement of Musculoskeletal Diseases assessment using the Nordic Body Map (NBM) method.

RESULTS

Table 1. The Characteristics of Continuous Data Subjects

Gender	**Subject**	**Percentages (%)**
Man	24	80%
Woman	6	20%
Age	**Subject**	**Percentages (%)**
17-25	21	70%
26-35	5	17%
36-45	4	13%

Table 2. Distribution of musculoskeletal disease assessments

NO	**Location**	**Grade of Complients Pre-test**		**Grade of Complients Post-test**	
		N	%	N	%
1	Pain in upper neck	42	35%	30	25%
2	Pain in lower neck	41	34%	30	25%
3	Pain in right shoulder	41	34%	30	25%
4	Pain in left shoulder	40	33%	30	25%

5	Pain in right upper arm	40	33%	30	25%
6	Pain in left upper arm	39	33%	30	25%
7	Pain in upper back	56	47%	50	42%
8	Pain in low back	57	48%	51	43%
9	Pain in right elbow	39	33%	30	25%
10	Pain in left elbow	39	33%	30	25%
11	Pain in right forearm	39	33%	30	25%
12	Pain in left forearm	39	33%	30	25%
13	Pain in right wrist	40	33%	30	25%
14	Pain in left wrist	40	33%	30	25%
15	Pain in right hand	39	33%	30	25%
16	Pain in left hand	42	35%	30	25%
17	Pain in right thigh	101	84%	77	64%
18	Pain in left thigh	99	83%	77	64%
19	Pain in the buttock	96	80%	76	63%
20	Pain in the bottom	95	79%	76	63%
21	Pain in right knee	98	82%	77	64%
22	Pain in left knee	101	84%	76	63%
23	Pain in right thigh	109	91%	90	75%
24	Pain in left thigh	109	90%	90	75%
25	Pain in right ankle	108	92%	90	75%
26	Pain in Left Ankle	110	92%	90	75%
27	Pain in Right Foot	110	92%	90	75%
28	Pain in Left Foot	113	94%	90	75%

Based on the data from the table above, the initial data collection (pre-test) obtained the results of the Nordic Body Map questionnaire, which consisted of 28 complaints. Specifically, 65% of respondents experienced moderate-high pain in the lower extremities of the body due to the working position of standing continuously, while 35% had low pain in the upper extremities of the body.

Table 3. Hypothesis Test with Wilcoxon.

Uji Wilcoxon Keluhan Muskuloskeletal

Test Statistics[a]	
	POST_NBM - PRE_NBM
Z	-4.716[b]
Asymp. Sig. (2-tailed)	.000

Based on the Wilcoxon test table showing a significance value of 0.000 (p <0.05), it can be concluded that there is an influence of Musculoskeletal Diseases before and after using custom foot orthosis.

DISCUSSION

Table 4 Data Analysis of Pretest and Posttest Musculoskeletal Diseases

Descriptive Statistics

	N	Mean	Std. Deviation	Minimum	Maximum
PRE_NBM	30	64.07	9.292	52	78
POST_NBM	30	50.67	3.614	46	56

The use of Custom foot orthosis based on the posttest results shows a decrease in Musculoskeletal Diseases after treatment, thus indicating that Custom foot orthosis effectively reduces Musculoskeletal Diseases in security while working. The average value of the results of musculoskeletal security complaints before treatment was 64.07, while after treatment, it was 50.67.

These results show that the average musculoskeletal security complaints decrease pain by 13.40 with a significance value of 0.000 ($p < 0.05$), where the most severe complaints are in the lower extremities. This statement is by research by Umang Parashar et al. in 2020 that using various foot orthotic modifications such as heel cups, arch supports, metatarsal pads, and total contact inserts showed promising results on pressure on the feet and dynamics of the lower limbs.

Shoe fit, design, and characteristics such as heel height and toe box, along with sole contour and thickness, are some of the important elements that influence foot comfort and leg muscle activation. This section can also be supplemented with research limitations.

CONCLUSION

Custom foot orthosis is an alternative intervention to reduce musculoskeletal diseases in the lower limbs.

RESEARCH LIMITATIONS

In this research, the design or execution of a research study can impact the outcomes and conclusions.

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