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The Effects A Customized Shoulder Support with Padding On Porters' Shoulder Pain At Pasar Legi Surakarta

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Abstract

Background: Markets, terminals, and port regions are frequent locations for porters, who are a part of the informal job sector. A lot of porters still use manual handling methods for moving things. The risk of musculoskeletal conditions, especially shoulder discomfort, is increased by excessive load weight. Using a specially designed shoulder support with foam and neoprene padding is one management approach that may be used. Research objective: find out that using a specially designed shoulder support with padding might reduce shoulder pain in Pasar Legi porters. Methode: This research used a quasi-experimental approach with a one-group pre-test and post-test design, and it was conducted out in February 2026 at Pasar Legi, Surakarta. Twenty participants with shoulder pain made up the research subjects. Result: A statistical study of 20 samples with shoulder pain showed a p-value of 0,000 ($p<0,05$), indicating that using a customized shoulder support with padding significantly reduced pain among Pasar Legi porters. Conlcusion: There is a significant effect of using a customized shoulder support with padding on reducing shoulder pain among porters at Pasar Legi Surakarta.

Keywords: Shoulder Pain, Shoulde Support, Orthoses, Porters

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1. Introduction

Porters represent an informal sector of employment in Indonesia. This type of work is commonly found in locations such as markets, terminals, and port areas, where they carry goods on their shoulders. Since porters manually transport loads, they are classified as workers who are at risk of developing musculoskeletal disorders (Nino et al., 2020). Musculoskeletal disorders are a major occupational health problem worldwide. Complaints of shoulder pain are one of the most frequently reported, with a prevalence of around 30-50% in physical workers (van Rijn et al., 2010). Shoulder pain will arise if the muscles receive repetitive loads over a long period of time, as a result of this, the joints, ligaments, and tendons can become injured (Semara et al., 2023). Shoulder pain is commonly reported by individuals and is linked to various clinical, occupational, and other factors. Physical demands at work can lead to shoulder pain, including activities such as lifting heavy loads, pushing or pulling objects, engaging in repetitive movements, and maintaining prolonged static postures (Gwinnutt et al., 2023).

Orthotic prosthetics is a branch of health science that provides tools to address musculoskeletal disorders. From a scientific perspective, orthotic prosthetics can provide tools in the form of customized shoulder supports with padding. Shoulder supports function to distribute the load more evenly on the body, reduce direct contact pressure on the shoulder, and provide additional stabilization to the shoulder muscles (Zubaidi & Akbar, 2025). In addition, shoulder pads function to prevent minor injuries such as bruises. This tool is used to provide a real impact in prevention and innovation of ergonomic solutions so that porters can maintain their work productivity and livelihoods.

2. Research Methods

The method used in this study is a quasi-experimental one group pretest-posttest design, which allows for the evaluation of differences in subject conditions before and after the intervention. This study was conducted at Pasar Legi, Surakarta, Central Java. The study was scheduled to take place in February 2026. In this study, the population was 500 porters at Pasar Legi in Surakarta.

The sampling technique that used in this study is purposive sampling. The inclusion criteria: (1) Aged 45-60 years (2) Has a working period of 25 years. (3) Currently experiencing pain on one side of the shoulder. (4) Experiencing mild-moderate musculoskeletal pain. (5) Working full time (8 hours) as a porter at Pasar Legi. (6) Willing to participate as a research subject. (7) Willing to use customized shoulder support with padding. The exclusion criteria: (1) Research subjects experiencing pain on both sides of the shoulder (2) Subjects taking painkillers or undergoing other therapy (3) Subjects having a history of neuropathic (nerve) disease and fractures (4) Subjects experiencing shoulder pain due to disease.

The measuring tool used is the Numeric Rating Scale (NRS) which has a function to evaluate the level of pain by respondents. Research respondents were measured on a pain scale before using the shoulder support, then measured again after using the shoulder support.

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3. Results and Discussion

a. Result

From a population of 500 individuals, 20 subjects met the established inclusion and exclusion criteria. The characteristics of these research subjects are as follows:

Tabel 1. Characteristic of subject

Characteristics	n	%
Gender		
Female	20	100
Male	0	0
Age		
45-49	4	20
50-54	9	45
55-59	1	5
60-64	6	30
Years of working		
25	6	30
26	3	15
27	1	5
30	7	35
35	3	15

Next is the pain scale data from the pre-test and post-test of the research subjects, before and after being given an intervention in the form of customized shoulder support with padding.

Tabel 2. Result of pre test and post test NRS

	n	Min	Max	Mean	Std. dev
Pre test	20	1	6	3.75	1.372
Post test	20	0	4	1.50	889

The Wilcoxon test was used in hypothesis testing. The results are as follows.

Tabel 3. Wilcoxon test result

	N	Mean rank	Sum of rank
Negative Ranks	20[a]	10.50	210.00
			0.00
Positive Ranks	0[b]	0.00	
Ties	0[c]		
Total	20		
Z	-3.963[b]		
Asimp Sig (2-tailed)	0.000		

The results of the Wilcoxon test show that the Z value is (-3.963) with p value of (0.000). If the p value is <0.05, it can be concluded that there is a statistically significant. the use of customized shoulder support with padding can reducing shoulder pain in porters.

b. Discussion

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This study was conducted on 20 porters at Pasar Legi in Surakarta who have shoulder pain and met the inclusion and exclusion criteria. This study used a purposive sampling technique. The use of customized shoulder supports with padding was used to determine whether there was a reduction in shoulder pain among porters. Primary data were obtained from the numerical rating scale (NRS) presented to the researchers by the study subjects. The customized shoulder supports with padding were used by subjects for three weeks. Using the device for 2-3 weeks resulted in a reduction in shoulder pain (Zubaidi & Akbar, 2025). Using a customized shoulder support with padding can provide shoulder stability, reduce shoulder pain, and mitigate the direct impact of the load on the body. The customized shoulder support with padding is made of neoprene, so it doesn't restrict the shoulder worker's movement when carrying the load. According to Chiu (Chiu et al., 2020), shoulder support functions to reduce pain, add stability, correct the alignment of the scapula, and pull the shoulder back into its anatomical position.

Customized shoulder support with padding functions to reduce and prevent shoulder pain, provide additional stability to the shoulder, distribute the load evenly, and reduce direct contact of the load on the body, thereby reducing the risk of injury (VIRANI et al., 2017). This device is suitable for porters who frequently carry excessive loads repeatedly while working. Customized shoulder support with padding consists of a strap that provides light compression, a shoulder support that supports the body to prevent excessive movement that increases the risk of injury, and padding that acts as a shoulder cushion to reduce pressure. The mechanism of action of a customized shoulder support with padding is to provide joint stability, more targeted compression, and better distribute mechanical pressure through the padding, thereby improving shoulder function (Amir et al., 2021).

4. Conclusion

The results of the Wilcoxon hypothesis test showed a p value of 0.000 < 0.05, so it can be stated that there is a significant influence in the use of customized shoulder support with padding on reducing shoulder pain of the porters at Pasar Legi Surakarta, before and after the use of the intervention. This is because customized shoulder supports with padding function to reduce and prevent shoulder pain, provide additional stability to the shoulder, distribute the load more evenly across the shoulder, and reduce direct contact of the load on the body, thereby reducing the risk of injury.

5. Compliance with ethical standards Acknowledgements

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Disclosure of conflict of interest

This research collaboration is a positive thing for all researchers so that conflicts, problems and others are absolutely no problem for all writers.

Statement of informed consent

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Every action we take as authors is a mutual agreement or consent.

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