



Socialisation and Training on Core Muscle Strengthening Exercises as an Effort to Reduce Low Back Pain among the MSME Community in Pedurungan District

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ABSTRACT

Low back pain is a common musculoskeletal complaint among workers whose activities involve prolonged sitting or standing and repetitive movements. This community engagement program aimed to increase understanding of low back pain and introduce practical core muscle-strengthening exercises within an MSME community in Pedurungan District, Semarang. The activity consisted of observation and coordination, a pre-test, interactive education, a 45-minute guided core exercise session using a chair, and a post-test. Fifteen MSME participants aged 45–63 years attended the program. The pre-test showed that all participants experienced lower back pain, and none recognised the importance of core strengthening. After education and guided practice, all participants understood the role of core muscles and the importance of regular movement. The activity indicates that education combined with guided practice can improve participants' knowledge and awareness of simple preventive strategies for lower back pain.

Nyeri punggung bawah merupakan keluhan muskuloskeletal yang sering dijumpai pada pekerja dengan aktivitas duduk atau berdiri dalam waktu lama dan gerakan berulang. Kegiatan pengabdian ini bertujuan meningkatkan pemahaman tentang nyeri punggung bawah dan memperkenalkan latihan penguatan otot core pada komunitas UMKM di Kecamatan Pedurungan, Semarang. Kegiatan meliputi observasi dan koordinasi, pre-test, edukasi interaktif, praktik latihan core selama 45 menit dengan bantuan kursi, dan post-test. Sebanyak 15 pelaku UMKM berusia 45–63 tahun mengikuti kegiatan. Hasil pre-test menunjukkan seluruh peserta mengalami nyeri punggung bawah dan belum memahami pentingnya penguatan otot core. Setelah edukasi dan praktik terpandu, seluruh peserta memahami peran otot core serta pentingnya bergerak secara berkala. Kegiatan ini menunjukkan bahwa edukasi yang disertai praktik dapat meningkatkan pengetahuan dan kesadaran mengenai upaya preventif sederhana terhadap nyeri punggung bawah.

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A. INTRODUCTION

Low back pain (LBP) is a musculoskeletal complaint that can interfere with comfort, functional activities, and work productivity. This condition is associated with repetitive work activities, prolonged static postures, poor posture, and suboptimal spinal muscle function. Among workers who engage in prolonged sitting or standing, these issues are particularly relevant and warrant promotive and preventive attention. A similar condition was identified among the MSME community in Pedurungan District. Based on the activity report, the participants came from the culinary, craft, and sticker sectors. Their business activities generally involved limited whole-body movement. Still, they required repetitive movements of certain body parts for several hours, while their overall body positions tended to remain passive, either sitting or standing. This situation provides an important context for workplace health education that can be easily applied to daily business routines.

Core muscle strengthening exercises are one approach to improving the strength and stability of the body's core muscles. Evidence among workers with myogenic low back pain indicates that core stability exercises can reduce the level of low back disability. Jumiati and Dewi (2022), for example, reported a significant reduction in disability scores among batik workers following an intervention involving Williams Flexion Exercises and Core Stability Exercises. In the context of community engagement, Ellyas et al. (2022) also demonstrated that education and strengthening exercise training can improve participants' knowledge and ability to perform exercises independently. Based on these conditions, this community engagement activity focused on socialising and training in core muscle strengthening exercises for the MSME community in Pedurungan District. The activity not only provided information about the causes and risks of low back pain but also demonstrated exercises that could be performed with chair assistance, making them easier for participants to follow. The objective of the activity was to increase participants' knowledge and awareness of low back pain and to introduce core muscle strengthening exercises as part of promotive and preventive efforts.

B. METHODS

The community engagement activity was conducted on Monday, June 15, 2026, from 07:00 to 09:00 at Suhada Permai Baru 1 Housing Complex, Tlogosari Kulon Subdistrict, Pedurungan District, Semarang City. The participants consisted of 15 MSME owners aged 45–63 years. Their business sectors included culinary businesses (snacks, chilli sauce, and catering), crafts (accessories, dolls, knitting, and screen printing), and sticker production. The activity employed a participatory educational approach consisting of five stages: (1) obtaining permits, conducting surveys, and carrying out observations; (2) coordinating preparations with the MSME management; (3) administering a pre-test; (4) providing health education and exercise training; and (5) administering a post-test. The pre-test was conducted to explore participants' experiences with low back pain, the efforts they had previously undertaken to address the condition, and their understanding of the importance of core muscles. The educational material was delivered interactively using presentation media for approximately 60 minutes. The practical session lasted approximately 45 minutes and involved core muscle-strengthening exercises in an enjoyable atmosphere. The exercises targeted the lower back, anterior abdominal muscles, lateral abdominal muscles, and gluteal muscles. Chairs were used as supporting equipment so that the exercises could be performed in both sitting and standing positions. Following the educational and practical sessions, participants completed a post-test to assess changes in their understanding. The results were analysed descriptively

by comparing participants' pre-test and post-test responses. This activity was not designed as a clinical trial to measure changes in pain intensity.

C. RESULTS AND DISCUSSION

1.1. Activity Implementation

The activity began with coordination between the community engagement (PkM) team and the head of the MSME community to cover permits, scheduling, venue, equipment, refreshments, and participant arrangements. A total of 15 MSME owners attended the activity. At the initial stage, participants completed a pre-test exploring their experiences with low back pain and the approaches they had previously used to manage their complaints. The pre-test results showed that all participants experienced low back pain, with complaints ranging from mild to moderately severe. Three participants were reported to have indications of pinched nerves at the L4 and L5 levels based on information shared during the activity. The approaches commonly used by participants to manage their complaints included lying down, massage, and occasional use of pain-relieving medication. These initial findings indicate a need for education that focuses not only on reducing symptoms when they occur but also on maintaining muscle function and developing healthy movement habits.



Figure 1. Delivery of educational materials on low back pain and core muscles.

The educational session covered the causes and basic anatomy of low back pain, the function of the core muscles, and the importance of core muscle strengthening. The material was delivered interactively, enabling participants to relate the explanations to their own work experiences. An educational approach followed by practical training is consistent with the community engagement activity reported by Ellyas et al. (2022), which demonstrated that education and training can help participants understand the benefits of exercise and perform the movements correctly.

1.2. Core Muscle Strengthening Exercise Practice

Following the educational session, participants engaged in core muscle strengthening exercises for approximately 45 minutes. The exercises were presented as enjoyable physical activities and incorporated chairs as supporting equipment. The use of chairs made it easier for participants to perform the movements in both sitting and standing positions according to their individual abilities. The exercises targeted the lower back, anterior abdominal muscles,

lateral abdominal muscles, and gluteal muscles. Throughout the activity, participants appeared enthusiastic about following the demonstrations and practical exercises.



Figure 2. Participants are practising core muscle strengthening exercises.

Conceptually, core muscle strengthening exercises are relevant for workers experiencing low back pain. A study by Jumiati and Dewi (2022) involving batik workers with myogenic low back pain showed that an intervention incorporating core stability exercises could reduce low back disability. This finding strengthens the rationale for selecting core exercises as educational and practical training materials in this community engagement activity. However, the reported activity did not conduct clinical measurements of changes in pain intensity or disability.

1.3. Changes in Participants' Understanding

Changes in participants' understanding were identified by comparing their pre-test and post-test responses. A summary of the results is presented in Table 1. At the beginning of the activity, all participants reported experiencing low back pain. All 15 participants were aware of the relationship between their complaints and prolonged sitting or standing. Still, they had not yet understood the underlying issue emphasised in the educational session, namely, the importance of core muscle condition. None of the participants initially indicated that strengthening the core muscles was important for addressing low back pain.

Table 1. Comparison of Participants' Understanding Before and After the Activity

No.	Understanding Indicator	Pre-test	Post-test
1	Experiencing low back pain	15 participants (100%) experienced LBP	All participants were still identified as experiencing LBP at the beginning of the activity; the post-test focused on understanding
2	Understanding the source of the problem	15 participants knew the direct causes but	15 participants understood the main material concerning the role of core muscles



		did not yet understand the core issue	
3	Recurrence of pain	15 participants reported recurrent complaints	Not quantitatively detailed in the post-test
4	Pain worsens with increasing age	7 yes; 5 no; 3 uncertain	Not quantitatively detailed in the post-test
5	Previous efforts have provided effective and lasting results	5 yes; 6 no; 4 uncertain	Participants understood the need for an exercise-based approach rather than only managing pain when it occurred
6	Importance of strong core muscles	0 yes; 15 no	15 participants understood the importance of core muscle strengthening

D. CONCLUSION

The socialisation and training on core muscle strengthening exercises for the MSME community in Pedurungan District were successfully conducted, receiving positive responses from all 15 participants. The pre-test results showed that all participants experienced low back pain and had not yet understood the importance of core muscle strengthening in addressing these complaints. Following the educational session and practical training, all participants understood the role of core muscles and the importance of performing regular exercises. The activity provided benefits, including increased knowledge and awareness of lower back health, as well as an introduction to simple exercises that can be incorporated into daily activities. For sustainability, the exercises should be performed regularly while taking into account each participant's individual abilities. Future activities are recommended to include longer-term monitoring and standardised pain or functional assessment instruments to more objectively evaluate changes in participants' physical condition.

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F.AUTHOR CONTRIBUTIONS

Metta Christiana (MC): activity planning, problem identification, coordination with partners, serving as the resource person, exercise implementation, results analysis, and article preparation. Shinta Eka Kartika (SEK): preparation of the venue and activity requirements, as well as implementation support. Saifullah Arif (SA): administrative preparation, attendance management, activity documentation, and implementation support. All authors contributed to the review and approval of the final manuscript.



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