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Protect Your Back, Improve Your Life: A Health Promotion Approach to Low Back Pain Prevention

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ABSTRACT
Background: *Low back pain is a musculoskeletal complaint commonly experienced by older adults, whether they are still working or performing routine activities at home. This condition can interfere with mobility and daily activities. This community service project aims to improve older adults' knowledge about the prevention of low back pain through health education and simple physical exercises.*

Methods: *The activity was conducted with 17 older adults at the Sakura 7 Posyandu in Tohudan Village, Colomadu Subdistrict, Karanganyar Regency. The intervention included education on low back pain, risk factors, and prevention, as well as demonstrations and practice of simple physical exercises. An evaluation was conducted to identify changes in pain complaints following the intervention.*

Results: *The evaluation results showed that 9 older adults (52%) experienced minimal change (minimal change detected) in their lower back pain complaints, while 8 older adults (48%) showed no change (no change detected). These findings indicate that the majority of participants began to experience changes in their complaints after participating in the educational activities and simple exercise practices.*

Conclusion: *Health promotion through education and simple physical exercises is a promotive and preventive measure to improve older adults' understanding of lower back pain prevention. Ongoing activities are needed to support the implementation of appropriate physical activity and improve the quality of life for older adults.*

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INTRODUCTION

Lower back pain (LBP) is a common health problem experienced by the public, especially those who are elderly or have jobs that require heavy physical activity (1). According to data from the Central Statistics Agency (BPS), in 2020, as many as 12.6% of the Indonesian population experienced lower back pain (2). Low Back Pain can cause discomfort, interfere with daily activities, and reduce quality of life (3). In addition, Low Back Pain can also affect people's productivity and life balance (4). People who experience Low Back Pain often have difficulty in doing daily activities, such as walking, sitting, and standing. This can cause people to feel frustrated, stressed, and

lose confidence (5). Therefore, community service efforts are needed that can help people manage NPB and improve their quality of life. These community service efforts can be in the form of health education, occupational therapy, and social support (6,7).

The problems associated with low back pain in the community generally include limited knowledge and understanding of appropriate prevention and management strategies, inadequate skills to independently manage symptoms and prevent recurrence, insufficient social support and community networks, and limited access to healthcare services, including occupational therapy interventions. These challenges highlight the need for community-based health promotion programs that provide accessible health education and practical skills to improve awareness and encourage appropriate self-management of low back pain. Furthermore, empowering older adults through regular education, simple physical exercises, and support from healthcare professionals and community cadres is essential to promote healthy behaviors and maintain functional independence (7–9).

Tohudan Village is located in Colomadu District, Karanganyar Regency, Central Java, Indonesia. The village is situated near the Hajj Dormitory and Adi Soemarmo International Airport, and its residents have diverse occupational backgrounds and daily activity patterns that may contribute to the risk of low back pain. Considering these community characteristics and potential health needs, Tohudan Village was considered an appropriate location for this community service program. The intervention was implemented among older adults attending the Sakura 7 Elderly Integrated Health Service Post (Posyandu Lansia), focusing on improving knowledge and promoting simple physical exercises for the prevention and management of low back pain.

Community service activities were conducted by lecturers as part of the Tri Dharma of Higher Education at the Ministry of Health Polytechnic of Surakarta. The activities took place in Tohudan Village, Colomadu District, Karanganyar Regency, Central Java, Indonesia. The community in this area has diverse occupational backgrounds and daily activity patterns, which may contribute to the risk of developing low back pain. Based on these characteristics, several population groups were identified as being potentially vulnerable to low back pain, including older adults, particularly those aged over 50 years, individuals engaged in physically demanding occupations such as construction workers, factory workers, and farmers, as well as housewives who perform repetitive household activities. People who are overweight are also at increased risk because excess body weight places additional mechanical stress on the spine and lower back muscles (10–12).

Other groups potentially at risk include individuals with poor posture, those with certain medical conditions such as osteoporosis, arthritis, or herniated discs, pregnant women experiencing postural changes and increased body weight, and individuals with a history of back or spinal injuries. Furthermore, people with sedentary lifestyles, insufficient physical activity, or prolonged sitting may also be more susceptible to low back pain. These diverse risk factors highlight the importance of community-based health promotion through education about proper body mechanics, healthy posture, regular physical activity, weight management, and simple exercises to prevent and reduce the risk of low back pain (13–15).

Based on the above description, this community service activity aims to determine changes in pain levels among older adults experiencing lower back pain after receiving health education and practicing simple physical exercises performed routinely every day. This activity also aims to improve older adults' knowledge and awareness

regarding risk factors, preventive measures, proper body mechanics, and self-management of lower back pain. It is hoped that this initiative will enhance the independence and quality of life of older adults through the adoption of regular physical activity and healthy lifestyle behaviors. Furthermore, this initiative is expected to serve as a model for community-based health promotion by involving healthcare workers, faculty members, and Posyandu volunteers in efforts to prevent and manage lower back pain among older adults.

METHODS

The community service activity was conducted at the Sakura 7 Senior Citizens' Health Post in Tohudan Village, Colomadu Subdistrict, Karanganyar Regency, Central Java. The participants were older adults experiencing low back pain who attended the Sakura 7 Elderly Health Post. The study sample consisted of 17 participants selected using total sampling—that is, all participants who were present and took part in the entire series of community service activities. The study employed a pre-experimental design using a one-group pre-test and post-test design to identify changes in participants' conditions before and after the intervention.

Preparation Phase

The preparation phase began with coordination with the managers and volunteers of the Sakura 7 Senior Citizens' Health Post to determine the implementation schedule, identify the program's target participants, and prepare the necessary intervention materials. The community service team developed health education materials on lower back pain, covering causes, signs and symptoms, risk factors, prevention, and management. The team also prepared an evaluation instrument, the Quebec Back Pain Disability Scale (QBPDS), to measure limitations in daily activities due to lower back pain.

Implementation Phase

The implementation of the activity began with a baseline measurement (pre-test) using the QBPDS questionnaire, which was completed by participants with guidance from the research team and assistance from Posyandu volunteers. The QBPDS consists of 20 daily activities, with a score range of 0–5 for each item. The total score ranges from 0–100, with a higher score indicating greater limitations in daily activities due to lower back pain. The minimum detectable change at a 90% confidence level is 15 points.

Next, participants received health education on the causes, signs and symptoms, risk factors, prevention, and management of lower back pain. The educational material included demonstrations of correct and incorrect body postures when sitting, lifting objects, bending over, and sleeping. The activity continued with demonstrations and practice of simple physical exercises to help manage lower back pain. The session concluded with a discussion and question-and-answer period. Before the session concluded, participants were instructed to practice the physical exercises and apply the principles of lower back pain prevention independently at home every day for two weeks as part of a home exercise program (home program).

Evaluation Phase

The evaluation was conducted two weeks after the health education and exercise demonstrations. The final assessment (post-test) used the same QBPDS questionnaire to determine changes in limitations of daily activities due to lower back pain. The pre- and post-intervention results were compared descriptively to identify changes in the participants' conditions after participating in the health education and self-directed home exercise program.

RESULTS

Preparation Stage

The community service program was conducted at Sakura 7 Elderly Integrated Health Service Post (Posyandu Lansia), Tohudan Village, Colomadu District, Karanganyar Regency, involving 17 participants. All participants were women. As presented in Table 1, the majority were aged over 60 years (12 participants; 70%), while five participants (30%) were under 60 years old. Regarding occupational characteristics, 10 participants (59%) were housewives, and seven (41%) were employees. The preparation stage also included coordination with Posyandu officers and the preparation of educational materials, exercise demonstrations, and the QBPDS questionnaire as the evaluation instrument.

Table 1. Characteristics of Participants (n = 17)

Characteristics	Frequency (n)	Percentage (%)
Gender		
Female	17	100
Male	0	0
Age		
Over 60 years	12	70
Under 60 years	5	30
Occupation		
Housewife	10	59
Employee	7	41
Total	**17**	**100**

Implementation Stage

The implementation stage began with an initial assessment (pre-test) using the QBPDS to identify participants' functional limitations related to low back pain. Participants subsequently received health education covering the causes, symptoms, risk factors, prevention, and management of low back pain. The educational session included demonstrations of correct and incorrect body positions during sitting, lifting objects, bending, and sleeping. Participants also practiced simple physical exercises designed to help manage low back pain. The session concluded with discussions and question-and-answer activities. Participants were encouraged to perform the demonstrated exercises independently at home every day for two weeks.



Figure 1. Activity Documentation

Evaluation Stage

Evaluation was conducted two weeks after the intervention using the same QBPDS questionnaire. The results indicated that nine participants (52%) experienced score changes exceeding the minimum detectable change (MDC) threshold, while eight participants (48%) demonstrated changes below this threshold. The findings are presented in Table 2.

Table 2. Changes in Quebec Back Pain Disability Scale Scores (n = 17)

Score difference	Frequency (n)	Percentage (%)	Interpretation
≥15 points	9	52	Change exceeding the MDC
Less than 15 points	8	48	Change below the MDC
Total	**17**	**100**	

These findings indicate that nine participants demonstrated changes in functional disability that exceeded the measurement threshold following the health promotion intervention. However, the direction of score changes need to be considered to determine whether functional limitations improved or worsened.

DISCUSSION

The results of the community service activity showed a change in the Quebec Back Pain Disability Scale (QBPDS) scores among all 17 participants after they received health education and practiced simple physical exercises. A total of 9 participants (52%) experienced a change in score that exceeded the minimum detectable change (MDC), while 8 participants (48%) experienced a decrease in score but did not reach the MDC threshold. These results indicate that all participants experienced changes in their scores reflecting activity limitations due to low back pain, although the magnitude of the changes varied.

A decrease in the QBPDS score indicates an improvement in the participants' ability to perform daily activities that were previously impaired by low back pain. However, only changes exceeding the MDC can be considered to have surpassed the margin of measurement error at the specified confidence level. These findings provide an initial indication that health promotion through a combination of education and simple physical exercise practices has the potential to support the management of lower back pain in older adults.

Knowledge Enhancement

Health education through discussion and question-and-answer sessions helped participants understand the causes, risk factors, signs, and symptoms, as well as prevention strategies for lower back pain. During the program, it was found that

participants were largely unaware of several risk factors, particularly those related to improper body posture, repetitive movements, prolonged sitting, and incorrect lifting techniques in daily activities. After receiving education, participants demonstrated better understanding and awareness of the importance of maintaining proper posture and adhering to ergonomic principles during activities. Increased knowledge is a crucial first step toward behavioral change, as understanding risk factors can help individuals identify activities that may cause or exacerbate lower back pain. These findings align with previous research showing that the use of booklets provides strong evidence for improving knowledge, while health professionals reinforcing the information can enhance confidence in the educational material and adherence to exercises for managing lower back pain. Thus, health education should not only focus on conveying information but also connect the material to people's daily experiences and activities (15–17).

Improving Skills and Self-Management Abilities

In addition to increasing knowledge, simple physical exercise practice sessions help participants develop skills in performing stretching movements and applying ergonomic principles in daily activities. Demonstrations accompanied by direct guidance from healthcare professionals provide participants with the opportunity to practice movements correctly and understand safe body positions when sitting, bending, lifting objects, and performing household chores. A hands-on approach is crucial for older adults because health information is more easily applied when participants have the opportunity to observe, try, and receive immediate corrections. The ability to perform simple exercises independently also supports the development of self-management skills and encourages older adults to take an active role in maintaining their mobility (18,19).

Self-management is a key component in the management of lower back pain. The public needs adequate knowledge and skills to determine appropriate physical activities, manage symptoms, and know when to seek help from healthcare professionals. Previous literature emphasizes that healthcare professionals and the healthcare system need to empower the community by providing knowledge and skills so that they can make appropriate decisions regarding the management of lower back pain and general health. Self-management does not mean that a person must face their health problems without the assistance of healthcare professionals. Rather, this approach encourages active individual involvement while maintaining access to healthcare services for examinations, symptom relief, and professional advice. In the context of this activity, the involvement of healthcare workers and Posyandu volunteers can strengthen community support and promote the sustainability of self-directed exercises at home (6,15,20).

Implications for Community Health Promotion

The results of the activity demonstrate the importance of integrating health education with demonstrations and physical exercise practice in health promotion programs for older adults. Education can improve understanding, while hands-on practice provides participants with the opportunity to translate knowledge into skills and preventive behaviors in daily life. The involvement of Posyandu volunteers also has the potential to support the sustainability of the activities through monitoring, reinforcing educational messages, and motivating older adults to exercise at home. However, the

results of this study should be interpreted with caution because the number of participants was limited to 17, and no control group was used. Furthermore, the two-week evaluation period was insufficient to assess the long-term impact of the intervention. Future studies should consider a longer monitoring period, more comprehensive functional assessments, and an evaluation of exercise adherence to determine the sustainability of behavioral changes and functional abilities among older adults.

CONCLUSIONS AND SUGGESTIONS

Health promotion through education on how to prevent and reduce lower back pain for the elderly is very necessary. The results of the study showed good improvements for the elderly who experienced pain, and what actions should be taken to prevent the onset of lower back pain. This educational action needs to be carried out at other elderly health posts, and more intensive monitoring is carried out so that the benefits are more visible.

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DECLARATION OF USE OF AI IN SCIENTIFIC WRITING

AI tools were used solely for grammar and language editing. The authors take full responsibility for the content and integrity of the manuscript.

CONFLICT OF INTERESTS

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