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Low Back Pain *Prevention Training and Education* to Improve the Health and Independence of the Elderly

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Abstract

The increase in the number of elderly people in Indonesia has an impact on increasing musculoskeletal health problems, one of which is Low Back Pain (LBP) or low back pain. This condition can reduce the mobility, independence, and quality of life of the elderly. This community service activity aims to provide training and education on LBP prevention through a promotive and preventive approach so that the elderly are able to maintain their health and increase independence in daily activities. The implementation methods include health counseling, demonstrations of stretching and strengthening of back muscles, and assistance with independent practice. The results of the activity showed an increase in elderly knowledge about the causes and prevention of LBP which was initially 39.66% and after the training increased to 69.88%, as well as an increase in the ability to practice correct exercises. Thus, this activity is effective in increasing the awareness and ability of the elderly to maintain spinal health and maintain life independence.

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Introduction

The aging process leads to a decrease in the function of the body's organs, including the system *Musculoskeletal* which plays an important role in the movement and independence of the elderly. One of the problems that is often experienced is *Low Back Pain* (LBP), which is pain in the lower back that can be caused by spinal degeneration, muscle weakness, wrong posture, and lack of physical activity (Park et al., 2023). According to data from the Indonesian Ministry of Health, the prevalence of LBP in the elderly reaches more than 30% and tends to increase with age (Perdana Putra et al., 2022).

Arso 14 Area, Skanto District is one of the areas in Keerom Regency Papua with a fairly high number of elderly people compared to other areas. Complaints often experienced by the elderly Case *Low Back Pain* (LBP) in the elderly in this area is quite high. The degree of quality of life in the elderly is determined by their ability to maintain optimal physical health and functional independence (Beltz et al., 2022).

LBP has an impact on limited functional activities, sleep disorders, decreased quality of life, and even the risk of dependence on others in daily activities (Ge et al., 2022). Therefore, promotive and preventive efforts through training and education are essential to help the elderly understand how to prevent LBP and maintain life independence. This community service activity is designed as a form of academics' contribution in increasing the awareness, knowledge, and skills of the elderly towards the prevention of LBP through a community physiotherapy approach that is applicable and easy to practice at home.

Materials and Methods

This activity was held at Posyandu Arso 14 Sukamaju Village, for one day with a total of 65 elderly participants. The implementation method includes three main stages:

1. Preparation Stage

Kelly, J. G. (2014) The preparation stage is an important first step to ensure that community service activities run effectively and on target. At this stage, the implementation team conducted a field survey in the Arso 14 area, Keerom Regency, Papua, to identify the health conditions of the elderly, especially related to complaints of low back pain, as well as their level of knowledge about its prevention. This survey also aims to find out the needs of participants and determine training methods that are in accordance with the characteristics and abilities of the elderly in the area.

Kusuma, et al (2021) The purpose of elderly posyandu cadres and village officials coordinating to obtain support and cooperation in the implementation of activities. Posyandu cadres play an important role in assisting in collecting participant data, disseminating activity information, and facilitating training venues. Through good coordination between the service team, health cadres, and village officials, this activity can be prepared carefully so that the entire training and education process can run smoothly and provide optimal benefits for the local elderly community.

Figure 1. Providing Training and Education to the Elderly

2. Implementation Stage

The implementation stage of this community service activity was carried out at the Posyandu Elderly in the Arso 14 area, Keerom Regency, Papua, by involving a team of physiotherapists as the implementer of the activity. The implementation of the activity began with health education which was delivered interactively to the participants. The counseling material includes explanations of the anatomy of the spine, the causes of *Low Back Pain* (LBP), as well as various daily habits that can trigger back pain, such as wrong posture, the habit of sitting for too long, or lifting heavy weights without the correct technique. This activity aims to increase the understanding of the elderly about the importance of maintaining spinal health and avoiding risk factors for low back pain.

After the education session, the activity continued with physical exercise training focused on LBP prevention exercises. Participants were taught several simple exercises that included stretching the back and abdominal muscles, strengthening core muscles, and posture improvement exercises *(postural alignment).* The exercises are carried out in stages with direct guidance from the physiotherapist so that each participant is able to follow the movements according to their physical abilities.

During the training process, intensive assistance was carried out by the service team. This assistance includes monitoring training techniques, correction of inappropriate movements, and providing daily practice guidelines that can be done independently at home. With a participatory and educational approach, this activity not only provides knowledge, but also equips the elderly with practical skills to maintain health and prevent back pain independently.

3. Evaluation Stage

Simula et al., (2019) the evaluation stage was carried out to assess the effectiveness of training and education activities for the prevention *of Low Back Pain* on increasing participants' knowledge and understanding. This evaluation was carried out through pre-tests and post-tests given to all elderly before and after the activity. The pre-test is used to measure the participant's initial level of knowledge about spinal anatomy, the factors that cause back pain, and how to prevent it. After all education and training sessions are completed, a post-test is carried out to find out the extent of the increase in knowledge and understanding after the intervention is given.

The results of the evaluation showed an increase in knowledge scores in most of the participants, which indicates that the counseling and training methods used were effective in delivering material and increasing the awareness of the elderly on the importance of maintaining spinal health. In addition to evaluating knowledge, the team also observed the participants' ability to practice the physical exercises that had been taught. In general, the elderly are able to follow movements well and show high enthusiasm to continue training independently. Thus, this evaluation stage is an important basis in assessing the success of the program as well as a reference for improving service activities in the future.

Results and Discussions

The results of low back pain prevention training and education to improve the health and independence of the elderly are as follows:

Table 1. Knowledge Level of the Elderly before Training (*Pretest*) and after Training (*Posttest*)

Category	Analysis Score	*Pretest*		*Posttest*	
		Result	%	Result	%
Very high	40.06<	0	0 %	4	6,15 %
Tall	31,61-40,06	0	0 %	46	70,77 %
Keep	23,16-31,61	7	10,77 %	15	23,08 %
Low	14,71-23,16	57	87,69 %	0	0
Very low	< 14.71	1	1,54 %	0	0
Result		65	100 %	65	100 %

Based on the results obtained, the level of knowledge of the elderly about the prevention *of low back pain* to improve health and independence before being given training was in the low category, namely 57 elderly (87.69%), followed by the medium category of 7 elderly (10.77%), and very low 1 elderly (1.54%). Based on the results obtained, the level of knowledge of the elderly about the prevention of LBP to improve health and independence after being given training was in the high category, namely 46 elderly (70.77%), followed by the medium category of 15 elderly (23.08%), and very high 4 elderly (6.15%). The difference between pretest and posttest can be seen in graph 1 as follows.

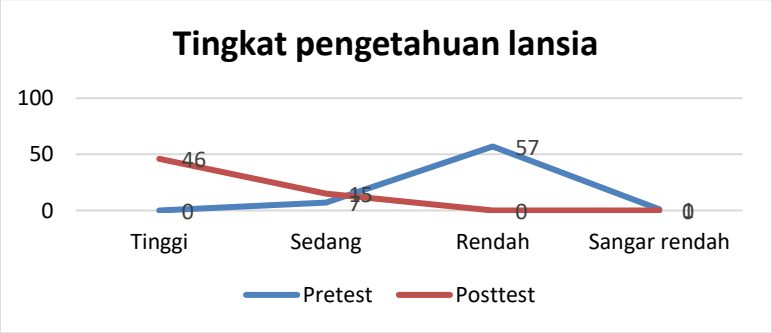

Figure 2. Elderly Knowledge Level Graph

The difference in results before and after LBP prevention training to improve the health and independence of the elderly can be seen in the results of the analysis using the t-test (*wilcoxon)* which are as follows:

Table 2. Results of the analysis of the t-test (*Wilcoxon*)

Knowledge Posttest - Knowledge Pretest	
Z	-7.012b
Asymp. Sig. (2-tailed)	.000

Based on the analysis of the t-test (*wilcoxon*) the value of Sig. (2-tailed) = 0.000 was obtained. The value of Sig. (2-tailed) = 0.000 < 0.05, thus showing that there was a significant difference and increase in results from before and after the provision of *low back pain* prevention training materials to improve the health and independence of the elderly.

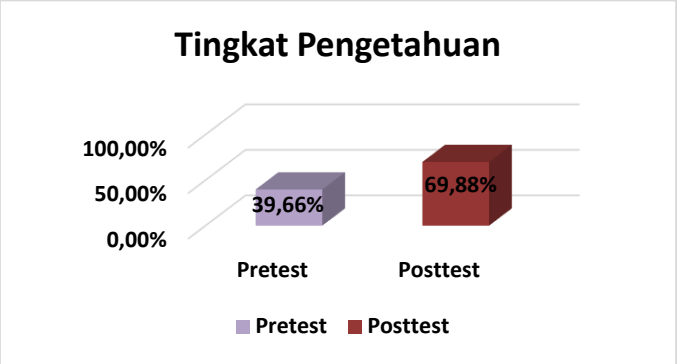

Figure 3. Inspired by Knowledge Enhancement

Based on figure 2, it can be explained that before being given low back pain *prevention training* to improve the health and independence of the elderly, the level of knowledge of the elderly was only at 39.66% and after the provision of knowledge of the elderly increased to 69.88%.

Syarifah (2025) educational activities are proven to increase knowledge to reduce LBP. The elderly are an age group that experiences various physiological changes due to the aging process, including decreased muscle strength, tissue elasticity, and joint function. This condition increases the risk of LBP or low back pain, which is one of the most common musculoskeletal disorders in the elderly population. LBP can hinder daily activities, reduce independence, and have an impact on reducing the quality of life of the elderly. Therefore, interventions that are promotive and preventive are needed to maintain their physical health and independence.

Ayuningtias, et al (2024) management to prevent LBP is very important to overcome injury pain. In line with the training and education on LBP prevention carried out in community service activities, this has proven to be effective in improving the knowledge and skills of the elderly related to the importance of maintaining spinal health. Through interactive education, participants gain an understanding of the causes of back pain, risk factors, and prevention strategies through posture improvement, regular physical activity, and exercises to strengthen the back and abdominal muscles. The results of the evaluation showed an increase in knowledge after the activity took place. Seniors are able to recognize the early signs of back pain and understand the importance of light physical exercise as part of prevention. Taught stretching and strengthening exercises, such as pelvic tilt, bridging, and stretching of the back muscles, are easy to practice at home without the need for special tools. Ramona (2023) Older people need to recognize the early signs of back pain and understand the importance of light physical exercise as part of pencegahan.ini is important because limited mobility and access to health facilities are often obstacles for the elderly.

In addition, this training also plays a role in increasing the motivation and confidence of the elderly to stay physically active. Dwisetyo (2024) through a community physiotherapy approach, this activity not only emphasizes the physical aspect, but also builds collective awareness of the importance of living healthy and independent in old age. Social support from peers and health workers during the activity also strengthens the spirit of participation and the sustainability of exercise practices in their respective environments (Puspitasari & Andini, 2025). Neherta & Refnandes (2024) health intervention training has a good impact on society. This activity shows that simple interventions based on education and preventive exercises can have a significant impact on improving the health and independence of the elderly. Regular and continuous implementation is highly recommended so that the benefits obtained can be maintained in the long term. Thus, LBP prevention

training and education can be a model of effective community service activities in supporting promotive and preventive efforts in the field of community physiotherapy (McGill, 2025).

Conclusion

LBP prevention training and education activities carried out in Arso 14, Keerom Regency, Papua, have a positive impact on increasing the knowledge, awareness, and ability of the elderly to maintain spinal health. Through interactive education and simple exercises based on community physiotherapy, participants were able to understand risk factors and how to prevent low back pain independently. This program has also succeeded in increasing the motivation and active participation of the elderly in doing light physical activities that are safe and regular. Thus, this activity makes a real contribution to improving the health, independence of life, and quality of life of the elderly in the Arso 14 community. This kind of intervention proves that education-based promotive and preventive approaches are very effective in the community, especially in areas with limited access to health services.

The implementation of this activity shows positive results and needs to be developed sustainably. Therefore, it is recommended that similar programs can be carried out regularly by involving various parties, such as elderly posyandu cadres, health workers, and local governments, to ensure the sustainability and effectiveness of activities. Health cadres are expected to be companions for the elderly in monitoring and motivating the implementation of back pain prevention exercises independently at home. In addition, the preparation of simple educational media such as exercise modules, posters, and guide videos can help the elderly remember and apply the exercises correctly. Soulissa (2025) collaboration between the community and health workers is useful for expanding the reach of health promotion. Collaboration between educational institutions, physiotherapy professions, and health service facilities is also important to expand the reach of these promotive and preventive activities to other regions in Papua. In the future, further evaluation and research are also needed to assess the effectiveness of the program in the long term in reducing back pain complaints as well as improving the quality of life and independence of the elderly in the community.

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