



THE EFFECT OF PROGRESSIVE MUSCLE RELAXATION AND WARM COMPRESSES ON CHANGES IN LOW BACK PAIN LEVELS IN THE ELDERLY: CASE STUDY



Putri Handoyo*, Wahyudi Mulyaningrat, Annas Sumeru
Department of Nursing, Faculty of Health Sciences, Universitas Jenderal Soedirman, Purwokerto, Indonesia

ABSTRACT

Introduction: Low back pain is one of the most common musculoskeletal complaints found in the elderly population. Treatment of low back pain in the elderly needs to be done carefully, considering the many side effects of using drugs for pain management. Various non-pharmacological alternatives can be done to overcome low back pain, one of which is a combination of progressive muscle relaxation therapy and warm compresses. **Purpose:** This study aims to determine the reduction in the level of low back pain in patients after being given progressive muscle relaxation therapy and warm compresses. **Methods:** case study with a nursing care approach to the elderly with low back pain. Respondents in this study were 3 elderly patients with low back pain. The intervention was carried out for 3 consecutive days for 45-60 minutes each meeting. Before and after pain level measurements were carried out at each meeting. **Discussion:** The results of measuring the level of low back pain using a numeric rating scale showed that 3 patients experienced a decrease in pain levels. The first patient experienced a decrease in pain from 3 to 1, the second patient experienced a decrease in pain from 4 to 2, and the third patient experienced a decrease in pain from 5 to 3. **Conclusion:** Providing a combination of progressive muscle relaxation and warm compresses can reduce the level of low back pain in the elderly and can be applied independently by patients and their families.

Keywords: Low back pain, progressive muscle relaxation, warm compress

Citation: Handoyo P, Mulyaningrat W, Sumeru A. 2025. 5(2). The Effect of Progressive Muscle Relaxation And Warm Compresses On Changes In Low Back Pain Levels In The Elderly:Case Study. *International Journal of Biomedical Nursing Review*. P46-50.
<https://doi.org/10.20884/1.ijbnr.2026.5.2.16866>

INTRODUCTION

Elderly (>60 years) are one of the risk groups who experience many changes ranging from sensory, cognitive, psychological, physical, social, and environmental so that they are susceptible to health problems. Various chronic diseases such as hypertension, heart, diabetes mellitus, and chronic pain are the most common health problems experienced by the elderly. Chronic pain that is often experienced by the elderly will cause functional disabilities such as cognitive disorders and sleep pattern disorders (Zahro et al., 2022).

Low back pain is one of the most common musculoskeletal complaints found in the elderly population. Low back pain will cause pain in the lower back that usually radiates to the legs. As we age, physiological changes

occur such as decreased tissue elasticity, muscle weakness, and degeneration of the spinal structure that increase the risk of low back pain (Safei et al., 2024).

Low back pain in Indonesia has a prevalence of 18% according to data from the Ministry of Health. This condition often occurs in individuals aged 40 years and over and is expected to continue to increase over time. Most cases are caused by non-specific factors, such as soft tissue disorders, muscle injuries, tendons, ligaments, spasms, and muscle fatigue. Meanwhile, specific causes of LBP include spinal fractures, infections, and the presence of lesions or tumors (Aprilia et al., 2021). Data from the World Health Organization (WHO) shows that around 60–70% of the general population has experienced low back pain in their lifetime,

*Correspondence Author:

Putri Handoyo; Department of Nursing, Faculty of Health Sciences, Jenderal Soedirman University, Purwokerto.
putri.handoyo021@mhs.unsoed.ac.id

Received: 03-07-2025
Approved: 28-05-2026
Published: 12-06-2026

with a higher incidence in the elderly (WHO, 2019).

Various non-pharmacological alternatives can be used as pain management, one of which is relaxation techniques. The combination of warm compress therapy and progressive muscle relaxation is a promising approach in reducing pain complaints without significant side effects. Warm compresses work by increasing local blood flow, relaxing tense muscles, and helping to reduce mild inflammation in the surrounding tissue. Meanwhile, progressive muscle relaxation is a therapeutic technique that involves systematic contraction and relaxation of muscle groups, which has been shown to be effective in reducing muscle tension levels and pain perception (David & Sari, 2020). Research by Richard and Wulan Sari (2020) found that the combination of warm compresses and progressive muscle relaxation was able to significantly reduce joint pain levels in the elderly at the RW 04 Elderly Posyandu, Kediri City. This shows that progressive muscle relaxation can be used as an effective, safe, and easy-to-do non-pharmacological method for treating pain, especially in the elderly population. These results strengthen the potential of both techniques to be applied to patients with low back pain, so that it is expected to improve the comfort and quality of life of the elderly.

Previous studies have demonstrated the effectiveness of warm compresses and progressive muscle relaxation separately, as well as their combination in reducing joint pain among older adults. However, evidence describing the implementation of a combined progressive muscle relaxation and warm compress intervention specifically for elderly patients with low back pain using an Evidence-Based Nursing (EBN) case study approach remains limited. To the best of our knowledge, this case study is among the first to report the application of these combined interventions in elderly individuals with low back pain within a community nursing setting. Therefore, this study aims to describe changes in low back pain levels following the

implementation of progressive muscle relaxation and warm compress therapy in elderly patients.

Based on the description, the author is interested in discussing the effect of a combination of progressive muscle relaxation and warm compresses on changes in pain levels in the elderly with low back pain. This study aims to determine the decrease in low back pain levels in patients after being given progressive muscle relaxation therapy and warm compresses.

METHOD

This study is a case study approach that describes Evidence Based Nursing (EBN) in nursing practice. Nursing care was provided to 3 elderly patients with low back pain. This case study was conducted in Tanggeran Village, Somagede District, Banyumas Regency from April 28 to May 5, 2025. In this case study, several inclusion criteria were applied, namely patients with low back pain, patients in the elderly category (60-74 years). While the exclusion criteria applied were respondents who had open wounds in the lower back, and respondents with impaired consciousness. Pain measurement for pre and post intervention used a numeric rating scale. Implementation procedure, determining the topic of the case study referring to the PICO analysis (Problem, Intervention, Comparison, and Outcome) and conducting an EBN search through the Google Scholar database. The next stage of implementing EBN is adjusted to the problems that exist in the respondents based on the results of the assessment that has been obtained. The data collection stage was carried out by measuring the level of pain after applying therapy for 45-60 minutes in 3 consecutive days with pre and post observations of pain level measurements carried out at each meeting.

RESULT

The study was conducted on April 28-29, 2025. The study subjects were 3 patients with female gender as shown in the following table.

Table 1. Patient demographic data

Patient date	Patient 1	Patient 2	Patient 3
Name initials	Ny.G	Ny. P	Ny.K
Age	70 years old	68 years old	74 years old
Gender	female	female	female

Education	Primary School	Primary School	-
Job	Not working	Not working	Not working
Religion	Islam	Islam	Islam

The results of the assessment of each patient, namely the first patient, Mrs. G, aged 70 years, lives in RT 4 RW 3. Mrs. G often feels pain in the lower back area that spreads to the thigh area. Mrs. G said that the pain had been felt for a long time but in the last few months it felt worse, the pain was like being stabbed, the pain worsened when doing heavy activities such as walking fast and far, and lifting heavy loads. Mrs. G said that the pain she felt now was on a scale of 3 out of 10, Mrs. G said that the pain she felt now was like the feeling when being injected by a doctor but the pain came and went and always appeared in the morning when she woke up when she was going to do activities.

The second patient, Mrs. P, aged 68 years, data was obtained that Mrs. P lives in RT 1 RW 3. Mrs. P lives with her husband and 6th child who is not yet married. Mrs. P often feels pain in the lower back area. Mrs. P said that the pain had been felt since the beginning of this year but in the last few days it felt worse, the pain was like being stabbed, the pain got worse when doing heavy activities such as walking fast and far, washing clothes for a long time. Mrs. P said that the pain she was feeling now was on a scale of 4 out of 10,

Mrs. P said that the pain she was feeling now was deep and the pain was persistent.

The third patient, Mrs. K, aged 74 years old, Mrs. K often feels pain in the lower back area that spreads to the legs. Mrs. K said that the pain had been felt for years, the pain was like being stabbed. The pain worsens when doing heavy activities such as walking fast and far, lifting fairly heavy loads. Mrs. K said that the pain she feels now is on a scale of 5 out of 10, Mrs. K said that the pain she feels now is like a strong stabbing sensation, for now the pain comes and goes.

Provision of warm compresses and progressive muscle relaxation is carried out once a day for 3 days. The mechanism begins with measuring the level of pain using a numeric rating scale, followed by giving a warm compress for 15 minutes and resting for 5 minutes. Furthermore, progressive muscle relaxation is given for 15-20 minutes and resting for 5 minutes. Then the level of pain is measured after the intervention is given. The following are the results of measuring the level of pain before and after the intervention which is monitored using a numeric rating scale

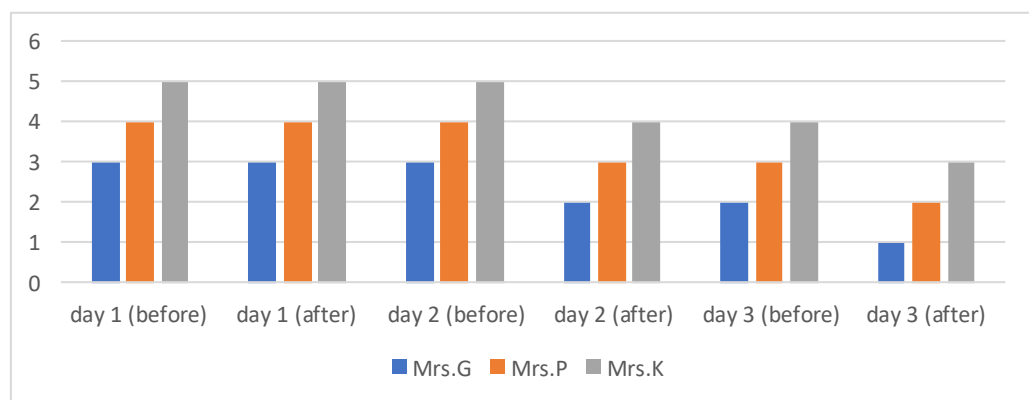


Figure 1. Reduction in Pain Level

Figure 1 shows that after the combination of warm compresses and progressive muscle relaxation, the client experienced a consistent decrease in pain scale. Mrs. G during the assessment complained that the pain she felt was on a scale of 3 where the pain was very pronounced like a stabbing sensation when injected by a doctor but she could still do daily activities and communicate well. After the intervention, the scale decreased to 1

where the pain was very mild although still felt. Mrs. P during the assessment, the pain she felt was on a scale of 4, the pain she felt was strong and deep. After the intervention, the pain decreased to a scale of 2, it felt like a light pinch. Furthermore, Mrs. K during the assessment complained that her pain was on a scale of 5 where the pain she felt was like stabbing strongly. After the intervention, Mrs. K said the pain improved and was on a scale

of 3, the pain was still there like being stabbed but had decreased and was more comfortable to carry out activities.

DISCUSSION

Low back pain is often caused by overworked or tense muscles. Signs and symptoms of back pain vary, including stabbing pain and making it difficult to stand and move (Nazhira et al., 2023). Pain is a feeling of discomfort experienced by the body due to external stimuli. Low back pain is a musculoskeletal disorder due to incorrect positioning characterized by pain in the costal border area and the inferior gluteal fold which is usually accompanied by pain to the lower legs. Risk factors for low back pain include age, body mass index, smoking habits, lack of exercise, length of service, work position, and workload (Wafia & Irawan, 2023).

Low back pain is a complaint that is closely related to age, this pain usually begins to be felt by those in the second decade of life until it peaks in the fifth decade (Mustagfirin et al., 2020). This is in accordance with the results of a study conducted on 3 elderly people with an age range of 65-75 years, it was found that all three elderly people experienced low back pain. The pain was like being stabbed and some spread to the legs. The pain felt was very disruptive to the daily activities of the elderly. Therefore, low back pain is a problem that must be overcome by the elderly. Pharmacologically, of course, there are chemical drugs that are widely used to treat low back pain in the elderly, but they often cause side effects that are not good for the body. In this regard, non-pharmacological treatment is needed as pain management in the elderly. Non-pharmacological treatments that can be used to relieve low back pain include progressive muscle relaxation therapy and warm compresses (Hauk, 2017).

Several studies have shown that warm compresses and progressive muscle relaxation can reduce low back pain. Warm compresses are included in superficial thermal therapy that works to increase local tissue temperature. Physiologically, the mechanism of this warm compress consists of a heat process that causes blood vessels in the compressed area to widen, thereby increasing local blood flow, accelerating the transport of oxygen and nutrients to the tissues, and accelerating the removal of metabolic waste (eg lactic acid) that causes pain. With warm

compresses, the muscles become more elastic and reduce muscle spasms, this is very beneficial for musculoskeletal pain such as low back pain. In addition, heat can also stimulate the release of endorphins, which are hormones that act as the body's natural analgesic (Aditya & Hasina, 2020). This was also conveyed by Freiwald et al., in 2021, who stated that one of the purposes of warm compresses is to reduce pain and improve blood circulation.

Meanwhile, progressive muscle relaxation relies on alternating muscle tension and release to activate the body's relaxation response. Physiologically, progressive muscle relaxation will reduce the sympathetic nervous system (Widyastuti & Nopriani, 2024). So combining warm compress therapy and progressive muscle relaxation is a complementary approach to pain management, where warm compresses work locally by increasing blood flow and relaxing muscles in the painful area while progressive muscle relaxation provides a more holistic effect by reducing muscle tension which supports long-term recovery.

Based on the results of the case study, it was shown that all three clients experienced low back pain. After measuring the level of pain using a numeric rating scale, it was found that before the implementation, the first client experienced pain on a scale of 3, then after the intervention for 3 days it decreased to a scale of 1, the second client before the intervention experienced pain on a scale of 4 and after the intervention for 3 days it decreased to a scale of 2, the last client before the implementation experienced pain on a scale of 5, then after the intervention for 3 days the pain decreased to a scale of 3. These results are in accordance with research (David & Sari, 2020) which states that warm compresses and progressive muscle relaxation can reduce pain in the elderly with an average pain reduction of 1.45 and 1.61, which can be concluded that warm compresses and progressive muscle relaxation therapy can be used to reduce the pain scale in the elderly. This is in line with research (Hauk, 2017) which explains that progressive muscle relaxation and warm compresses are recommended for the treatment of patients with low back pain because they can provide moderate improvement in low back pain.

Based on the results of observations during the implementation, the three patients felt relaxed and the pain level decreased

gradually. After giving warm compress therapy and progressive muscle relaxation to the three clients, their backs felt more comfortable to move. Clients and families said they could do warm compresses and progressive muscle relaxation independently because this therapy is easy to do and makes the body more relaxed and more comfortable to do activities. According to the theory and results of case studies, it shows that the combination of warm compresses and progressive muscle relaxation can reduce the level of low back pain. After combining the two therapies, researchers found that the combination of warm compresses and progressive muscle relaxation was effective in reducing the pain scale in elderly clients with low back pain.

CONCLUSION

The implementation of progressive muscle relaxation and warm compresses has been proven to reduce the level of low back pain in the elderly. This is evidenced by observations of a decrease in pain levels showing that all three patients experienced a decrease in pain levels. The first patient experienced a decrease in pain from a scale of 3 to a scale of 1, the second patient from a scale of 4 to a scale of 2, and the third patient from a scale of 5 to a scale of 3.

REFERENCES

- Aditya, P. R., & Hasina, S. N. (2020). Perbedaan Terapi Bekam Dan Kompres Hangat Terhadap Tingkat Nyeri Punggung Bawah Pada Lansia. *Jurnal Keperawatan*, 12(1), 33–40.
- Aprilia, L., Solichin, & Trisanti Puspitasari, S. (2021). Gambaran Keluhan Low Back Pain (LBP) pada Pekerja Menjahit dengan Pengukuran Visual Analog Scale (VAS). *Sport Science Health*, 3(3), 117–124. <http://journal2.um.ac.id/index.php/jfik/indexhttp://fik.um.ac.id/>
- David, S. R., & Sari, D. A. K. W. (2020). The Influence of Warm Compress and Progressive Muscle Relaxation Therapy in Decreasing Joint Pain to Elderly at Posyandu Lansia RW 04 Kelurahan Bangsal Kota Kediri. *Journal Of Innovation And Applied Technology*, 06(02), 1031–10371. <http://jiat.ub.ac.id>.
- Freiwald, J., Magni, A., Fanlo-Mazas, P., Paulino, E., De Medeiros, L.S., Moretti,

- B., Schleip, R., & Solarino, G. (2021). A Role For Superficial Heat Therapy In The Management Of Non-Specific, Mild-To-Moderate *Low back pain* In *Current Clinical Practice: A Narrative Review*. In *Life* (Vol. 11, Issue 8). Mdp Ag. <https://doi.org/10.3390/Life11080780>
- Hauk, L. (2017). Low back pain: american college of physicians practice guideline on noninvasive treatments. *American Family Physician*, 96(6), 407–408.
- Mustagfirin, I., Nataliswati, T., & Hidayah, N. (2020). Studi Literatur Review: Latihan Stretching Terhadap Penurunan Tingkat Nyeri Punggung Bawah Pada Lansia. *Jurnal Ilmiah Kesehatan Sekolah Tinggi Ilmu Kesehatan Majapahit*, 12(2), 143–155.
- Nazhira, F., Sirada, A., Faradillah, K.R., Ismiyasa, S.W., Wibisono, H., Taufiqurrahman, M.B., & Aji, B.P. (2023). Edukasi Nyeri Punggung Bawah Guna Meningkatkan Produktifitas Lansia. *Bernas: Jurnal Pengabdian Kepada Masyarakat*, 4(3), 2039–2043. <https://doi.org/10.31949/Jb.V4i3.5851>
- Safei, I., Nadraini, M., Hidayati, P. H., Muchsin, A. H., & Surdam, Z. (2024). Prevalensi dan Gambaran Pasien Low Back Pain pada Lansia. *Fakumi Medical Journal: Jurnal Mahasiswa Kedokteran*, 04(04), 259–270.
- Wafia, A.I.N., & Irawan, D.S. (2023). Peningkatan Pengetahuan Komunitas Lansia Dalam Mencegah Dan Mengatasi Nyeri Punggung Bawah Berbasis Home Program Di Kelurahan Bandungrejosari Kota Malang. *Jurnal Ventilator: Jurnal Riset Ilmu Kesehatan Dan Keperawatan*, 1(4), 98–105. <https://doi.org/10.59680/Ventilator.V1i4.676>
- Widyastuti, A., & Nopriani, Y. (2024). Pengaruh Progressive Muscle Relaxation (PMR) Terhadap Penurunan Tekanan Darah dan Nyeri pada Lansia. *Jurnal Kesehatan Tambusai*, 5(2), 4170–4181.
- Zahro, S. F., Pusparini, P., Widowati, S. A., & Ati, S. N. (2022). Pengaruh Terapi Aktivitas Kelompok (TAK) Relaksasi Otot Progresif Terhadap Nyeri dan Kesehatan Mental Lansia. *Jurnal Kesehatan Komunitas Indonesia*, 2(1), 103–111. <https://ebsina.or.id/journals/index.php/jkki>