



The Effect of Warm Compresses of Lemongrass and Moringa Leaves on Reducing Pain in Arthritis Patients at the Krangkeng Health Center, Indramayu Regency

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Abstract

Rheumatoid Arthritis is an autoimmune disease that causes inflammation of the joints, resulting in pain, stiffness, and swelling. In October 2023, there were 50 cases at the UPTD Krangkeng Health Center, Indramayu. This study aims to determine the effect of warm compresses of boiled lemongrass and moringa leaves on reducing pain in rheumatoid arthritis patients at the UPTD Krangkeng Health Center, Indramayu. This study used a quantitative method with a quasi-experimental design and involved 50 patients using a total sampling technique. Data analysis included univariate analysis, normality test, and bivariate test with Wilcoxon. The results showed that the average pain intensity of the lemongrass group before the intervention was 6.80, and the average after the intervention was 1.20. The average pain intensity of the moringa group before administration was 6.72, and the average after administration was 1.32. The Wilcoxon signed ranks test results were obtained with a p-value of lemongrass = 0.000 and a p-value of moringa = 0.000. This shows a significant decrease in pain after being given a warm compress of boiled lemongrass and a warm compress of boiled moringa leaves. This can be continued as an intervention carried out independently in rheumatoid arthritis patients or by the UPTD Krangkeng Health Center as a non-pharmacological therapy to reduce pain intensity in rheumatoid arthritis patients.

Keywords: Arthritis, Moringa leaves, warm compress, lemongrass.

Abstrak

Arthritis Rheumatoid adalah penyakit autoimun yang menyebabkan peradangan pada persendian, mengakibatkan nyeri, kekakuan, dan bengkak. Pada Oktober 2023, terdapat 50 kasus di UPTD Puskesmas Krangkeng, Indramayu. Penelitian ini bertujuan untuk mengetahui pengaruh kompres hangat rebusan serai dan daun kelor terhadap penurunan nyeri pada pasien rheumatoid arthritis di UPTD Puskesmas Krangkeng, Indramayu. Penelitian ini menggunakan metode kuantitatif dengan desain Quasi-eksperimen dan melibatkan 50 pasien dengan teknik total sampling. Analisis data meliputi analisis univariat, uji normalitas, dan uji bivariat dengan Wilcoxon. Hasil penelitian menunjukkan bahwa rata-rata intensitas nyeri kelompok serai sebelum intervensi yaitu 6.80 dan rata-rata setelah intervensi yaitu 1,20, Rata-rata intensitas nyeri kelompok kelor sebelum pemberian adalah 6.72 dan rata-rata sesudah pemberian adalah 1,32. Hasil uji Wilcoxon signed ranks test diperoleh dengan p value serai = 0.000 dan p value kelor = 0.000. Hal ini menunjukkan bahwa terdapat penurunan nyeri yang signifikan setelah diberikan kompres hangat rebusan serai dan kompres hangat rebusan daun kelor. Ini dapat dilanjutkan sebagai intervensi yang dapat dilakukan secara mandiri pada pasien rheumatoid arthritis atau pihak UPTD Puskesmas Krangkeng sebagai terapi non-farmakologi untuk menurunkan intensitas nyeri pada pasien rheumatoid arthritis.

Kata Kunci: Arthritis, daun kelor, kompres hangat, serai.

1. Introduction

Rheumatoid arthritis is an inflammatory disease characterized by joint lining inflammation, which causes pain, stiffness, weakness, redness, swelling, and heat. This condition affects people aged 20 to 50. Rheumatoid arthritis is more commonly understood as a disease that targets joints, muscles, and bodily tissues (Nurfitriani & Fatmawati, 2020).

Many millions of individuals have joint and bone disease, according to the World Health Organisation (WHO) in Yanti & Arman (2018), this number is expected to rise dramatically due to the large number of people over 50 in 2020. In an appeal known as the Bone and Joint Decade, the Secretary General of the United Nations (UN) and the World Health Organisation (WHO) have called on governments worldwide to act promptly and collaborate with organizations that address musculoskeletal diseases, as well as health professionals at the national and international levels for the prevention and management of musculoskeletal diseases (Yanti & Arman, 2018). According to WHO data from 2016, 20% of the global population suffered from rheumatoid arthritis; 5–10% of those affected were between the ages of 5 and 20, and 20% were beyond the age of 55 (Andri, Padila, Sartika, Putri, & J, 2020).

Rheumatoid arthritis affects 7.30% of the population in Indonesia, Kementerian Kesehatan Republik Indonesia (2018), In addition to the rising number of Indonesians who have rheumatoid arthritis, there is a comparatively high degree of ignorance and misinformation regarding this condition. This circumstance explains why Indonesians, particularly those who suffer from the disease, do not know much about rheumatoid arthritis. According to Indonesian health workers' diagnoses, the prevalence of joint disease is 11.9%, while based on the disease's symptoms, it is approximately 24.7%. East Java has the lowest prevalence of joint disease (26.9%), while East Nusa Tenggara has the most significant prevalence (33.1%), followed by West Java (32.1%) and Bali (30%). (Sukmara, Iriani, & Lestari, 2023).

Joints are where two or more ends of bones meet; joints create segmentation of the body's skeleton and allow movement between segments and various degrees of bone growth. Diseases that usually attack joints are joint pain. An inflammation of the joints that manifests as pain, heat, redness, swelling, and limited mobility is called joint discomfort. In this condition, the patient is very disturbed if more than one joint is affected. Joints often affected by pain are the joints at the ends of the body, such as the thumb, while other targets are the joints in the elbows, knees, ankles, and hands or shoulders (5). According to Hidayah (2019), this disease, if not treated properly, can cause minor injuries, such as joint damage, but also severe injuries, such as paralysis and even death (13). According to Aisyah (2017), there are two ways to treat pain: pharmacologically and non-pharmacologically (14). According to Umaht Rrk, Mulyana H, and Purwanti R., Pharmacological effects can be achieved by

administering NSAIDs (Non-Steroidal Anti-Inflammatory Drugs), including ibuprofen, naproxen, and piroxicam. While non-pharmacological measures can relieve pain, they are usually less risky than pharmacological measures. Non-pharmacological interventions can be used to relieve pain, one of which is a warm compress (Umaht, Mulyana, & Purwanti, 2021).

Umaht et al. (2021) in their research also stated that warm compress therapy can relieve pain. Warm compresses on the part of the body that feels painful are expected to reduce pain intensity. With warm compresses, blood vessels dilate, resulting in increased blood circulation and capillary pressure. The pressure of O₂ and CO₂ in the blood increases while the pH decreases. Cell activity increases, and in some muscles, it will reduce tension so that pain is reduced and does not interfere with daily activities (Udiyani, 2018). According to Komala Sari, Herlina, Aisyah Nur, Sri Ramadani Saintika (2021) and Widiyanto et al., (2020), warm compresses can often be applied to several herbal plants, including moringa leaves. In addition to moringa leaves, warm compress applications are often done with lemongrass .

Widiyanto et al. (2020) did a study utilising the Wilcoxon test to measure the pain level of gout patients before and after applying warm compresses of moringa leaves. The study found a significant decrease in pain score, with a p-value of 0.000 <0.05. The study conducted by Widiyanto et al. (2020) found that warm compresses made from moringa leaves were successful in alleviating joint pain in older individuals with gout in Boyolali Petronaya Village. Pebrianti & Sari (2022), suggest that lemongrass can be utilised in warm compresses, alongside moringa leaves. This particular plant possesses properties such as thermogenic, anti-inflammatory, and vasodilatory effects.

Anwar & Barus (2020) found that the pretest findings of warm lemongrass compress on the pain scale were 5.87. The pain scale posttest result for the warm lemongrass compress was 3.33. The study investigates the impact of warm lemongrass compress on pain reduction in rheumatism patients at the Babussalam Nurul Hikmah Nursing Home in the Batang Kuis District.

A study by Hidayat (2020) revealed a significant decrease in the pain scale among respondents who received warm lemongrass compresses. Before the treatment, the average pain scale was 4.94, whereas, after the treatment, it decreased to 2.97. This difference was statistically significant, as indicated by a p-value of 0.000. This aligns with the findings of Nurfitriani & Fatmawati (2020), who demonstrated that the mean pain score before applying warm lemongrass compresses was 6.86. After administering warm lemongrass compresses, the mean pain score decreased to 4.13, with a p-value of 0.000. This indicates a significant reduction in the intensity of rheumatoid arthritis pain. Studies conducted by (Komala Sari, Herlina, Aisyah Nur, Sri Ramadani, & Tinggi KesehatanSyedzaSaintika (2021); Olviani & Sari (2020);

Syamsuddin & Pakaya (2021) have demonstrated a reduction in pain levels following the application of warm lemongrass compresses.

From the results of a preliminary study conducted by the author at the Krangkeng Health Center, there were 50 patients with arthritis, 16 male patients, and 34 female patients. The age range of men with arthritis was 44-64, and women were 44-75. Arthritis patients at the health center were only given analgesic drugs from the health center to reduce pain, and the health center provided no non-pharmacological therapy.

From the description above, a warm compress is a non-pharmacological action that can be done to relieve pain in arthritis. So, researchers are interested in warm compresses of boiled lemongrass and moringa leaves that can reduce arthritis pain.

2. Method

This study is a quasi-experiment with a control two-group pretest-posttest design that aims to determine the average pain scale in the control and intervention groups. The intervention group that received treatment was evaluated by measuring the pain scale after receiving a combination of warm compresses with boiled lemongrass (intervention) and a compress with boiled moringa leaves (control). Moreover, this study was conducted to determine the Effect of Warm Compresses with Boiled Lemongrass and Moringa Leaves on Reducing Pain in Arthritis Patients at the UPTD Krangkeng Health Center, Krangkeng District, Indramayu Regency in 2024. The population in this study were patients with arthritis in the UPTD Krangkeng Health Center area, Krangkeng District, Indramayu Regency, with a total of 50 people with an average age of 44-75 years taken on October 10, 2023. The sample in this study was 50 people, using total sampling based on certain considerations made by the researcher himself based on the characteristics or properties of the population that were previously known. The criteria for respondents are inclusion criteria and exclusion criteria.

In this study, the research instrument for the independent variable is in the form of an SOP used to study warm compresses with boiled lemongrass and warm compresses with boiled moringa leaves, and the dependent variable is in the form of an observation sheet and a pain intensity scale measurement sheet with (Numerical Rating Scale). The numeric rating scale is used more as a substitute for word description tools. In this case, the client assesses pain using a scale of 1-10. The most effective scale assesses pain intensity before and after the intervention.

Statistical tests using the T-test showed that the results obtained in clients 1 and 2 were experiencing a pain scale before and after being given warm compress therapy with boiled lemongrass and warm compresses with moringa leaves. Data analysis in

this study was carried out by testing univariate and bivariate analysis using the Shapiro-Wilk Test.

3. Results and Discussion

3.1 Univariate Data

Respondent characteristics, including age and gender, are presented in the following table.

Table 1. Respondent Characteristics

No	Characteristics	Frequencies (F)	%
Age			
1	36 – 45 years old	9	18
2	46 – 55 years old	19	38
3	56 – 64 years old	14	28
4	65 – 75 years old	8	16
	Total	50	100
Sex			
1	Male	16	32
2	Female	34	68
	Total	50	100

Based on Table 1, the characteristics of respondents based on age are mostly 46-55 years old, namely 19 respondents (38%), and a few are 65-75 years old, namely 8 respondents (16%). Based on gender characteristics, most are female, namely 34 respondents (68%), while males are 16 respondents (32%).

3.1.1 Pain Level

The pain felt by respondents is presented in the following tables.

Table 2. Distribution of Pain Levels Before Warm Compress with Lemongrass Decoction

No	Pain Scale	Frequencies (F)	%
1	Moderate Pain	11	44
2	Controlled Severe Pain	14	56
	Total	25	100

Based on Table 2 above, data on the pain level was obtained before the warm compress with boiled lemongrass; out of 25 respondents, there were 11 respondents (44%) in the moderate pain category and 14 respondents (56%) in the controlled severe pain category.

Table 3. Distribution of Pain Levels After Warm Compresses with Lemongrass Decoction

No	Pain Scale	Frequencies (F)	%
1	No-Pain	8	32
2	Mild Pain	17	68
	Total	25	100

Based on Table 3 above, data on the pain level after applying a warm compress with boiled lemongrass showed that out of 25 respondents, 8 respondents (32%) were in the no-pain category, and 17 respondents (68%) were in the mild pain category.

Table 4. Mean Value of Pain Levels from Warm Compresses with Lemongrass Decoction

Based on Table 4 shows the level of pain before the warm compress with boiled

No	Pain Condition	N	Min	Max	Mean	Std. Deviation
1	Pain Level before Lemongrass	25	5	9	6.80	1,155
2	Pain Level after Lemongrass	25	0	3	1,20	1,041

lemongrass was given a Min value (5), Max value (9), and Mean value (6.80) with a standard deviation value (1.155). In contrast, the value after the warm compress with boiled lemongrass was given a Min value (0), Max value (3), and Mean value (1.20) with a standard deviation value (1.041).

Table 5. Distribution of Pain Levels Before Warm Compresses with Boiled Moringa Leaves

No	Pain Scale	Frequencies (F)	%
1	Moderate Pain	12	48
2	Controlled Severe Pain	13	52
	Total	25	100

Based on Table 5 above, data on the level of pain was obtained before the warm compress with boiled Moringa leaves; out of 25 respondents, 12 respondents (24%) were in the moderate pain category, and 13 respondents (26%) were in the controlled severe pain category.

Table 6. Distribution of Pain Levels After Warm Compresses with Boiled Moringa Leaves

No	Pain Scale	Frequencies (F)	%
1	No-Pain	8	32
2	Mild Pain	14	56
3	Moderate Pain	3	12
	Total	25	100

Based on Table 6 above, data on the level of pain after a warm compress with boiled Moringa leaves was obtained; out of 25 respondents, 8 respondents (16%) were

in the no-pain category, 14 respondents (28%) were in the mild pain category, and 3 respondents (6%) were in the moderate pain category.

Table 7. Mean Value of Pain Levels from Warm Compresses with Boiled Moringa Leaves

No	Pain Condition	N	Min	Max	Mean	Std. Deviation
1	Pain Level before Lemongrass	25	5	9	6.72	1,308
2	Pain Level after Lemongrass	25	0	4	1,34	1,314

Table 7 shows the level of pain before the warm compress with boiled moringa leaves was given a Min value (5), Max value (9), and Mean value (6.72) with a standard deviation value (1.308). In contrast, the value after the warm compress with boiled moringa leaves was given a Min value (0), Max value (4), and Mean value (1.32) with a standard deviation value (1.314).

3.2 Bivariate Data

A normalcy test was undertaken before doing a Statistical Test to evaluate the hypothesis. The results of the Shapiro-Wilk normality test indicate that the p-value before the intervention was less than 0.05 ($p < 0.05$). After the intervention, the p-value was less than 0.05 ($p < 0.05$). This suggests that the data is not normally distributed. Therefore, the hypothesis test employed in this study utilizes the Wilcoxon statistical test.

Table 8. Wilcoxon Test of Rheumatoid Arthritis Pain Intensity Before and After Lemongrass Compress

Pain Level After Lemongrass Compress - Pain Level Before Lemongrass Compress	
Z	-4.479 ^b
Asymp.Sig (2-tailed)	0,000

The Wilcoxon test calculation using SPSS yielded a significant value of 0.000, less than 0.05. Therefore, the null hypothesis (H_0) is rejected, and the alternative hypothesis (H_a) is accepted. However, the study examines how warm compresses containing lemongrass decoction affect pain reduction in arthritis patients before and after the treatment.

Table 9. Wilcoxon Test of Rheumatoid Arthritis Pain Intensity Before and After Moringa Leaf Boil Compress

Pain Level After Moringa Leaf Compress - Pain Level Before Moringa Leaf Compress	
Z	-4.491 ^b
Asymp.Sig (2-tailed)	0,000

The result of the Wilcoxon test calculation using SPSS above is 0.000 significant value $0.000 < 0.05$, then H_0 is rejected, and H_a is accepted. In other words, there is an

Effect of a Warm Compress of Boiled Moringa Leaves on Reducing Pain Intensity in Arthritis Patients Before and After a Warm Compress of Boiled Moringa Leaves.

Table 10. Comparison Test Between Warm Compress of Lemongrass Decoction and Warm Compress of Moringa Leaf Decoction

Group	N	Mean Rank	Sum Of Ranks
Lemongrass Group	25	25.40	635.00
Moringa Group	25	25.60	640.00
Total	50		

From the results of the comparative test using the Mann-Whitney test, the lemongrass group obtained a mean rank (25.40) and sum of ranks (635.00), while the moringa group obtained a mean rank (25.60) and sum of ranks (640.00).

3.3 Discussion

The study results showed that the frequency of respondents' ages in the lemongrass group had an average age of 45-55 years, with as many as 9 respondents (36%). At the same time, the moringa group had an average age of 45-55 years, as many as 10 respondents (40%), and 56-64 years as many as 10 respondents (40%). Age is an important variable that affects the reaction to pain, especially among the elderly. The differences in development found between these age groups can affect the reaction to pain, so it is necessary to carry out aggressive assessment, diagnosis, and management.

Most of the gender of the respondents in this study, the most in the lemongrass group, was female, with as many as 19 respondents (76%). In the moringa group, 15 respondents (60%) were female. One factor that affects the intensity of pain is the gender of the male or female.

Rheumatoid arthritis is more common in women because it is influenced by hormones that trigger rheumatism. In general, men and women are different in responding to pain. Men have lower sensitivity compared to women. This study illustrates that women are more at risk of suffering from rheumatoid arthritis than men.

This is in accordance with the theory put forward by Dugowson in Olviani & Sari (2020) that women are more often affected by Rheumatoid Arthritis in the knees and joints, and men are more often affected by Rheumatoid Arthritis in the thighs, knees, and joints. Rheumatoid Arthritis is more common in women than men; this indicates a hormonal role in the pathogenesis of Rheumatoid Arthritis.

3.3.1 Pain Intensity in Arthritis Patients Before and After Warm Compresses with Lemongrass Decoction

Based on the results of the study conducted on 25 respondents, it can be seen that the respondents who experienced the most arthritis pain before the warm compress of lemongrass decoction was the level of pain intensity with the criteria of moderate pain 11 respondents (22%), severe controlled pain as many as 14 respondents (28%).

In this study, the average pain scale before the action was taken in the lemongrass group was 6.80, while after the action was taken, the average pain scale value in the lemongrass group was 1.20, meaning the level of pain intensity with the criteria of no pain was 8 respondents (16%). Mild pain was present in 17 respondents (34%). So, the pain scale has an effect before and after the warm compress of lemongrass decoction.

Anwar & Barus (2020) found that the pretest findings of warm lemongrass compress on the pain scale were 5.87. The pain scale post-test result for the warm lemongrass compress was 3.33. The study investigates the impact of warm lemongrass compress on pain reduction in rheumatism patients at the Babussalam Nurul Hikmah Nursing Home in the Batang Kuis District.

3.3.2 Pain Intensity in Arthritis Patients Before and After Warm Compresses with Boiled Moringa Leaves

Based on the results of the study conducted on 25 respondents, it can be seen that the respondents who experienced the most arthritis pain before the warm compress of boiled moringa leaves was the level of pain intensity with the criteria of moderate pain 12 respondents (24%), severe controlled pain 13 respondents (26%).

In this study, the average pain scale before the action was taken in the moringa group was 6.72, while after the action, the average pain scale value in the moringa group was 1.32. This means that the level of pain intensity with the criteria of no pain was 8 respondents (16%), mild pain 14 respondents (28%), and moderate pain 3 respondents (6%). So, the pain scale is affected has an effect before and after the warm compress of boiled moringa leaves.

From this, it can be interpreted that respondents felt more mild pain than moderate pain after the warm compress of boiled moringa leaves. This shows that arthritis pain is reduced, and giving a warm compress of boiled moringa leaves is an effect because the moringa plant contains flavonoids, which have analgesic properties and pharmacological effects that can relieve pain or pain in the joints and muscles and improve blood circulation.

3.3.3 The Effect of Warm Compresses with Lemongrass Decoction on Reducing Arthritis Pain Intensity at the Krangkeng Health Center UPTD

Based on the results of the Wilcoxon test, the significant value of 0.000 means that the significant value is less than 0.05 ($0.000 < 0.05$). There is a significant difference

between the average value of arthritis pain in pretest observations, with a value of 6.80 and a standard deviation of 1.155, with a minimum value of 5 and a maximum of 9. In posttest observations, it has an average of 1.20 and a standard deviation of 1.041 with a minimum value of 0 and a maximum of 3. It can be said that warm compresses of lemongrass decoction reduce pain intensity in arthritis patients at the UPTD Krangkeng Health Center, Krangkeng District, Indramayu Regency.

This is in line with the research of Nurfitriani & Fatmawati (2020), which showed that the average pain scale before the warm lemongrass compress was 6.86, and after the warm lemongrass compress was given, the average pain scale was 4.13, with a p-value of 0.000, which means there was a decrease in the intensity of the rheumatoid arthritis pain scale. Research by Komala Sari, Herlina, Aisyah Nur, Sri Ramadani, & Tinggi KesehatanSyedzaSaintika (2021); Olviani & Sari (2020); Syamsuddin & Pakaya (2021) also showed a decrease in the pain scale after a warm lemongrass compress was given.

Based on the results explained above, warm lemongrass compress has a significant effect on reducing arthritis pain. So, a warm lemongrass compress can be recommended to minimize pain in arthritis patients. In addition, this compress is also practical without spending much money and is safe to use.

3.3.3 The Effect of Warm Compresses with Boiled Moringa Leaves on Reducing Arthritis Pain Intensity at the Krangkeng Health Center UPTD

The Wilcoxon test yielded a significant p-value of 0.000, indicating that the difference in average arthritis pain between pretest observations (mean = 6.72, standard deviation = 1.308) is statistically significant. The minimum pain value was 5, and the maximum was 9. During the posttest observations, the data has an average value of 1.32 and a standard deviation of 1.314. The smallest value recorded is 0, while the maximum value is 4. Warm compresses made from boiling moringa leaves effectively decrease the discomfort experienced by individuals with arthritis at the UPTD Krangkeng Health Center, located in the Krangkeng District of Indramayu Regency.

The findings of a study conducted by Widiyanto et al. (2020) provide evidence for this claim. The researchers used the Wilcoxon test to analyze the pain score of gout patients before and after applying warm compresses of moringa leaves. The analysis yielded a p-value of 0.000, less than the significance level of 0.05. The study found that warm compresses made from moringa leaves successfully treated joint pain in the elderly residing in Boyolali Petronaya Village. According to the findings above, the application of heated compresses made from boiling moringa leaves substantially alleviates arthritis pain.

So warm compresses of boiled moringa leaves can be recommended to minimize pain in arthritis patients. In addition, this compress is also practical without spending much money and is safe to use.

4. Conclusion

The level of pretest pain intensity in the lemongrass group with moderate pain criteria was 11 respondents (22%), and severe controlled pain criteria was 14 respondents (28%). The posttest pain intensity of the lemongrass group with no pain criteria was 8 people (16%), and the mild pain criteria was 17 respondents (34%). The pretest pain intensity level in the moringa group with moderate pain criteria was 12 respondents (24%), and severe controlled pain criteria was 13 respondents (26%). While the posttest pain intensity of the moringa group with no pain criteria was 8 people (16%), mild pain criteria were 14 respondents (28%), and moderate pain criteria were 3 respondents (6%). The average intensity of Arthritis pain before warm compresses with lemongrass decoction was 6.80, and the average intensity of rheumatoid arthritis pain after warm lemongrass compresses was 1.20. The average intensity of Arthritis pain before warm compresses with Moringa leaf decoction was 6.72, and the average intensity of rheumatoid arthritis pain after warm lemongrass compresses was 1.32. There was a significant effect for 5 consecutive days on reducing pain in arthritis patients at the Krangkeng Health Center, Krangkeng District, Indramayu Regency, in 2024.

References

- Aisyah, S. (2017). Manajemen Nyeri Pada Lansia Dengan Pendekatan Non Farmakologi. *Jurnal Keperawatan Muhammadiyah*, 2(1). <https://doi.org/10.30651/jkm.v2i1.1201>
- Andri, J., Padila, P., Sartika, A., Putri, S. E. N., & J, H. (2020). Tingkat Pengetahuan terhadap Penanganan Penyakit Rheumatoid Artritis pada Lansia. *Jurnal Kesmas Asclepius*, 2(1), 12–21. <https://doi.org/10.31539/jka.v2i1.1139>
- Anwar, S., & Barus, R. R. (2020). Pengaruh Kompres Serei Hangat Terhadap Pengurangan Rasa Nyeri pada Penderita Rematik Di Panti Jompo Babussalam Nurul Hikma Kecamatan Batang Kuis. *JURNAL PENELITIAN PENDIDIKAN, PSIKOLOGI DAN KESEHATAN (J-P3K)*, 1(1), 61–67. <https://doi.org/10.51849/j-p3k.v1i1.18>
- Hidayah, N. (2019). *Asuhan Keperawatan Pada Lansia Dengan Gout Arthritis Di Panti Sosial Tresna Werdha Nirwana Puri Samarinda*. Politeknik Kesehatan Kemenkes Kalimantan Timur.
- HIDAYAT, R. (2020). EFEKTIFITAS KOMPRES SEREI HANGAT TERHADAP PENURUNAN SKALA NYERI ARTHRITIS RHEUMATOID PADA LANSIA DI DESA NAUMBAI WILAYAH KERJA PUSKESMAS KAMPAR. *Jurnal Ners*, 4(1), 29–34. <https://doi.org/10.31004/jn.v4i1.715>

- Kementerian Kesehatan Republik Indonesia. (2018). Riset Kesehatan Dasar (Riskesdas) 2018. Retrieved August 30, 2024, from <https://layanandata.kemkes.go.id/katalog-data/riskesdas/ketersediaan-data/riskesdas-2018>
- Komala Sari, I., Herlina, A., Aisyah Nur, S., Sri Ramadani, H., & Tinggi KesehatanSyedzaSaintika, S. (2021). The Effectiveness of Lebrage Compress on Pain Reduction Rheumatoid Arthritis in the Elderly in the Region Lubuk Buaya Padang Health Center Work Year 2020. *Proceedings of the 2nd Syedza Saintika International Conference on Nursing, Midwifery, Medical Laboratory Technology, Public Health, and Health Information Management (SeSICNiMPH 2021)*, 39(SeSICNiMPH), 144–146. <https://doi.org/10.2991/AHSR.K.211026.027>
- Nurfitriani, N., & Fatmawati, T. Y. (2020). Pengaruh Kompres Serai Hangat terhadap Intensitas Nyeri Arthrtitis Rheumatoid pada Lanjut Usia di Panti Sosial Tresna Werdha Budi Luhur. *Jurnal Akademika Baiturrahim Jambi*, 9(2), 260. <https://doi.org/10.36565/jab.v9i2.231>
- Olviani, Y., & Sari, E. L. (2020). Pengaruh Kompres Hangat Rebusan Air Serai Terhadap Penurunan Nyeri Arthritis Rheumatoid Pada Lansia di Panti Sosial Tresna Werdha Budi Sejahtera Banjarbaru Provinsi Kalimantan Selatan. *DINAMIKA KESEHATAN: JURNAL KEBIDANAN DAN KEPERAWATAN*, 11(1), 387–396. <https://doi.org/10.33859/dksm.v11i1.536>
- Pebrianti, D. K., & Sari, M. T. (2022). Kompres Serai Hangat Mengurangi Nyeri Rheumatoid Arthritis. *Jurnal Abdimas Kesehatan (JAK)*, 4(1), 52. <https://doi.org/10.36565/jak.v4i1.211>
- Sukmara, T. R., Iriani, H. D., & Lestari, A. P. G. (2023). PENERAPAN TERAPI KOMPRES SERAI HANGAT UNTUK MENURUNKAN NYERI PADA PASIEN RHEUMATOID ARTHRITIS: LITERATURE REVIEW. *Journal of Nursing Practice and Science*, 2(1), 104–110.
- Syamsuddin, F., & Pakaya, A. W. (2021). PENGARUH KOMPRES SEREH HANGAT TERHADAP PENURUNAN NYERI RHEUMATOID ARTHRITIS PADA LANJUT USIA DI WILAYAH KERJA PUSKESMAS BOLIYOHUTO. *Zaitun (Jurnal Ilmu Kesehatan)*, 8(1). <https://doi.org/10.31314/zijk.v8i1.1160>
- Udiyani, R. (2018). PENGARUH PEMBERIAN KOMPRES HANGAT TERHADAP PENURUNAN NYERI REMATIK PADA LANSIA. *Jurnal Kesehatan STIKES Darul Azhar Batulicin*, 5(1), 72–76.
- Umaht, R. R. K., Mulyana, H., & Purwanti, R. (2021). Terapi NON FARMAKOLOGI BERBAHAN HERBAL UNTUK MENURUNKAN NYERI REMATIK: A LITERATURE RIVIEW. *Jurnal Keperawatan BSI*, 9(2), 183–191.
- Widiyanto, A., Pradana, K. A., Hidayatullah, F., Atmojo, J. T., Putra, N. S., & Fajriah, A. S. (2020). EFEKTIFITAS KOMPRES HANGAT DAUN KELOR TERHADAP NYERI ASAM URAT PADA LANSIA DI DESA KENTENG,NOGOSARI, BOYOLALI. *Avicenna : Journal of Health Research*, 3(2). <https://doi.org/10.36419/avicenna.v3i2.422>

Yanti, E., & Arman, E. (2018). PENGARUH PEMBERIAN KOLANG KALING (*Arengea pinnata*) TERHADAP PENURUNAN SKALA NYERI REMATIK PADA LANSIA DI WILAYAH KERJA PUSKESMAS KUMUN. *Jurnal Kesehatan Saintika Meditory*, 1(1), 45-52. <https://doi.org/10.30633/JSM.V1I1.246>