

# THE EFFECT OF FOOT MASSAGE AND LAVENDER AROMATHERAPY ON RHEUMATOID ARTHRITIS PAIN INTENSITY IN THE ELDERLY IN THE PUBLIC HEALTH CENTER JEMBATAN KECIL BENGKULU CITY

\*Hendri Heriyanto, Hasyiyati Awanis, Mardiani

\*Health Polytechnic Bengkulu Ministry of Health, Department of Nursing  
Jalan Indragiri No. 03 Padang Harapan Bengkulu

[hendriasik79@gmail.com](mailto:hendriasik79@gmail.com)

---

## Abstract

In Indonesia, one of the highest health complaints experienced by the elderly is rheumatoid arthritis. In the province of Bengkulu in 2018 there were 13.2% or around 8,620 people of rheumatoid arthritis affecting the elderly. The purpose of this study was the fear of the influence of foot massage therapy and lavender aromatherapy on the intensity of rheumatoid arthritis pain in the elderly. This study used Pre-Experimental Designs in the form of one group pre-test and post-test design. This technique uses consecutive sampling of 30 people. Pain data collection used the Numeric Rating Scale (NRS) before and after intervention. Therapy carried out for 3 days with 15 minutes each for 2 weeks. Univariate analysis used Mean, Standard Deviation, Median, Minimum, Maximum and 95% CI. And bivariate analysis using paired t-test with 5%. Pain intensity in the elderly before being given foot massage therapy and lavender aromatherapy were 5.13 (moderate pain) and after being given foot massage therapy and lavender aromatherapy 3.03 (mild pain). The results of the paired t-test statistical test obtained a p value of 0.000 ( $p < 0.05$ ). The results of the paired t-test statistical test obtained a p value of 0.000 ( $p < 0.05$ ). There is an effect of foot massage therapy and lavender aromatherapy on the intensity of rheumatoid arthritis pain in the elderly. It is hoped that the staff can apply foot massage therapy and lavender aromatherapy as a safe and practical non-pharmacological method as an alternative in reducing pain intensity.

**Keywords:** *Foot Massage, Lavender Aromatherapy, Pain Intensity, Rheumatoid Arthritis, The elderly*

## Introduction

Rheumatoid arthritis is one of the highest health complaints experienced by the elderly. The incidence of rheumatoid arthritis in 2016 according to WHO is 20% of the world's population, 5-10% are those aged 5-20 years and 20% are those aged 55 years (Putri, Priyanto, 2019). According to the Basic Health Research (Riskesdas) (2018) the number of rheumatoid arthritis sufferers in Indonesia reached 7.30%. Data from the Bengkulu provincial health office in 2018 there were 13.2% of rheumatoid sufferers aged  $> 15$  years or around 8,620 people, most of whom attacked the elderly. While at the Jembatan Kecil health center in Bengkulu, the data on the total number of rheumatoid arthritis sufferers in January 2020 - January 2021 aged 60-69 years is 0.4% or around 30 people.

*Rheumatoid arthritis* one of the autoimmune diseases which is inflammatory arthritis in adult patients, someone who suffers

from this disease will experience symptoms in the form of pain in the synovial joint, tendon sheath, and will experience thickening due to inflammation followed by bone erosion and bone destruction around the joint. et al. 2016). Rheumatoid arthritis is a disease that is generally considered trivial by the public, because it does not cause death. Rheumatism is not treated immediately can make limbs function abnormally and can even cause lifelong disability (Tedampa, 2016).

Non-pharmacological management includes relaxation and guided imagination, distraction, music, cutaneous stimulation, giving warm and cold sensations, massage and aromatherapy (Potter & Perry, 2010). One of the non-pharmacological measures to relieve pain is to warm the sore joints and inhale aromatherapy, namely lavender aromatherapy. The mechanism of the method is the same as foot massage therapy or is called foot massage.

*Foot Massage* is the manipulation of connective tissue through hitting, rubbing or squeezing to have an impact on increasing circulation, improving muscle properties and providing a relaxing effect (Potter & Perry, 2011).

While lavender aromatherapy naturally functions as an anti-bacterial, fungal, viral, such as respiratory tract infections of the reproductive tract, burns, skin infections, insect bites, reduces anger, anxiety, depression, improves mental and physical balance (provides a sense of comfort, calm and sedation). ) (Nurhanifah, D, et al, 2020). Inhaling the aroma of lavender which contains linalyl acetate and linalool is useful for reducing pain and providing a relaxing effect because it stimulates alpha waves in the brain and will improve blood circulation. This action can affect the brain's limbic system which is the center of emotion, regulates mood, and memory to produce the neurohormonal serotonin which will relieve tension, stress, and anxiety and produce endorphins and enkephalins as pain relievers (Smeltzer &

Muliani's research results. R., et al. (2019) with the title "Cutaneous Stimulation (Foot Massage) Reducing Pain Scale in Elderly Patients With Rheumatoid Arthritis". The results of pain measurements before foot massage were carried out on rheumatoid arthritis pain in the elderly, some (59.1%) respondents experienced moderate pain and (40.9%) others experienced mild pain. After foot massage was performed on rheumatoid arthritis pain in the elderly, 8 respondents had no pain (36.4%), 13 respondents had mild pain (59.1%) and 1 respondent had moderate pain (4.5%). This means that there is a difference in pain scale before and after being given foot massage.

The results of the research by Herlina, et al (2017), with the title "The Effect of Lavender Aromatherapy on Reduction of Active Stage 1 Labor Pain". The results of the measurement of pain mean pain intensity in laboring mothers before being given lavender aromatherapy was 7.07 (severe pain) and after being given lavender aromatherapy was 5.53 (moderate pain). There was a decrease in pain intensity by 1.54.

Prasetyo's research results. M., et al. (2020) with the title "The Effect of Foot Massage and Inhalation of Lavender Aromatherapy on

Blood Pressure and Pain Post Elective Major Surgery". The results of the pain scale measurement were obtained with a decrease in the average (mean) decrease in pain intensity from an average of 3.12 to 2.00.

It can be seen from the results of several studies which state that there is a decrease after being given foot massage therapy and lavender aromatherapy. Therefore, the researcher wanted to find out if there was an effect if foot massage and lavender aromatherapy were used in reducing the intensity of pain felt by the elderly with Rheumatoid Arthritis.

## **Method**

This type of research is research *Pre-Experimental Designs* in the form of one group pre-test and post-test design. This study was conducted on one group without a control or comparison group. This research was conducted from December 2020 to April 2021 in the working area of the Jembatan Kecil Health Center in Bengkulu City. The data collection procedure on the first day of the study explained the objectives, benefits, confidentiality, and data collection procedures, prospective patients who agreed to become respondents then signed the consent form. After that, the respondent will be examined for pain intensity. Previously, the patient would be given an observation sheet regarding the intensity of rheumatoid arthritis pain. Next, the researcher will conduct a time contract for the intervention of foot massage and lavender aromatherapy. Foot Massage intervention and lavender aroma were carried out 3 times for 3 days with 15 minutes each for 2 weeks.

Patients who do not meet the procedure until the procedure is completed cannot meet the research criteria and are immediately replaced with other patients. On the third day after doing foot massage therapy and lavender aromatherapy, they were re-examined. Measurement of pain intensity was carried out by a team that is my friend so as not to be confused, measurements were carried out on the first day before the intervention was given and after three days of intervention, the patient's pain intensity measurement would be carried out again.

## Results

### Univariate Analysis

Univariate analysis in this study was to see the mean, median, minimum and maximum values, standard deviation and standard error and 95% confidence interval (CI) for mean based on patient characteristics, pain intensity characteristics before and after foot massage and aromatherapy therapy. lavender.

### Characteristics of the patient

The number of patients in this study were 30 people. Characteristics of patients in this study include age, gender, occupation, recent education.

**Table 5.1 Distribution of Average Age and Frequency Distribution of Gender, Occupation, Last Education, and Pain Intensity Level of Rheumatoid Arthritis Patients at the Jembatan Kecil Health Center in Bengkulu City**

No	Variable	Intervensi
1	<b>Usia</b>	
	Mean	63.93
	Min	60
	Max	69
	SD	2.959
	SE	0.540
	CI 95%	62.83-65.04
2	<b>Jenis kelamin</b>	
	Laki – laki	13 ( 43.3%)
	Perempuan	17 (56.7%)
3	<b>Pekerjaan</b>	
	Tidak bekerja	19 (63.3%)
	Bekerja	11 (36.7%)
4	<b>Pendidikan terakhir</b>	
	Tidak sekolah	16 (53.5%)
	SD	8 (26.7%)
	SMP	6 (20.0%)
5	<b>Tingkat intensitas nyeri</b>	
	Ringan	3 (10,0%)
	Sedang	26 (86,7%)
	Berat	1 (3,3%)

Based on table 5.1, the results of the analysis obtained that the mean age of rheumatoid sufferers was 63.93 years with a standard deviation of 2,959 years. The results of the interval estimation can be concluded that 95%, namely the mean age of the patients is 62.83 – 65.04 years. It can be seen that more than 56.7% of patients in this study were women. In this study, more than 63.3% of the sufferers did not work. And the last education was elementary school by 86.7%. With the level of pain intensity is in moderate pain of 86.7%.

**Table 5.2 Distribution of Average Pain Intensity of Rheumatoid Arthritis Patients Before Foot Massage Therapy and Lavender Aromatherapy at the Jembatan Kecil Health Center Bengkulu City**

Intensitas nyeri	Sebelum intervensi
Mean	5,13
N	30
SD	1.074
Min	3
Max	7
CI 95%	4.73-5.53

From Table 5.2 above, the results of the analysis showed that the mean intensity of rheumatoid arthritis pain before intervention was 5.13 with a standard deviation of 1,074 (95% CI: 4.73 – 5.53).

**Table 5.3 Distribution of Average Pain Intensity of Rheumatoid Arthritis Patients After Foot Massage Therapy and Lavender Aromatherapy at the Jembatan Kecil Health Center in Bengkulu City**

Intensitas nyeri	Setelah intervensi
Mean	3.07
N	30
SD	0.980
Min	1
Max	5
CI 95%	2.70–3.43

Based on table 5.3 above, the results of the analysis showed that the mean intensity of rheumatoid arthritis pain after the intervention was 3.07 with a standard deviation of 0.980 (95% CI: 2.70-3.43)

**Table 5.4 Data Normality Test Results**

Variable	<i>p</i> Value (nilai <i>Skewness</i> : SE)
	Kenormalan Data
Skala nyeri awal	-0.639 : 0.427 = - 1.496
Skala nyeri akhir	-0.141 : 0.427 = - 0.330

### Bivariate Analysis

Bivariate analysis was conducted to determine the effect of foot massage therapy and lavender aromatherapy on the intensity of rheumatoid arthritis pain in the elderly. Before the bivariate analysis was carried out, the researchers conducted a normality test using the Skewness value method for Std.Error with p-Value still at the value (-2 to +2) and the results of the processed data were normally distributed. Then the researchers conducted a bivariate analysis using the paired t-test with 5% to

determine the difference in the average increase in pain intensity before and after.

**Table 5.5 Distribution of Differences in the Mean Increase in Pain Intensity Before and After Foot Massage Therapy and Lavender Aromatherapy at the Jembatan Kecil Health Center in Bengkulu City**

Variable	Mean	SD	<i>palue</i> dalam kelompok
Sebelum intervensi	5.13	1.074	0.000
Setelah intervensi	3.07	0.980	

From table 5.5, it is found that the average value before the intervention was 5.13 (1.074) and after the intervention was obtained the average was 3.07 (0.980) there was a decrease of 2.06.

When viewed from the effect of the intervention, it was obtained using the paired t-test, showing the intervention group value was 0.000 ( $p$  Value < 0.05) which means that there was an effect of foot massage therapy and lavender aromatherapy and there was a difference in mean before and after the intervention.

## Discussion

### Characteristics of Rheumatoid Arthritis Patients at the Jembatan Kecil Health Center in Bengkulu City

The results showed that the age characteristics of patients with rheumatoid arthritis in the working area of the Jembatan Kecil Health Center had an age range of 62 - 65 years, with an average age of 63.93 years. This result is in line with the research conducted by Susanti, E (2017), which states that the majority of rheumatoid arthritis sufferers are in the age range of 60-65 years with a percentage of 36.7%. And also in line with Fadlilah's research, S (2018), which states that most of the

sufferers are in the range of 60-64 years with a percentage of 93.3%. The results of this study are not in line with research from Wahyurianto, Y (2017), which states that the age of the patient is in the range of 65 – 70 years with a percentage of 70.21%.

Characteristics of patients based on pain intensity in this study, namely the average pain intensity before 5.13 and pain intensity after 3.07. The results of this study are in line with the results of Marlana, F (2019) research, namely the average pain intensity before 5.2 and the average pain intensity after 3.4 A person suffering from rheumatoid arthritis pain influenced by the presence of psychological factors, where by giving more attention can also reduce the sensation of pain felt by the sufferer. Rheumatoid that is not treated properly will eventually make the limbs function abnormally and can even cause lifelong disability (Tedampa, 2016).

Characteristics of patients based on gender in this study most (56.7) were women. The results of this study are in line with research by Fadlilah, S (2018), where most of the sufferers (80.0%) are female. This result is also in line with research from Wahyurianto, Y (2017), most of the sufferers (63.83%) are female. And the results of this study are not in line with research from Susanti, E (2017), most of the sufferers (63.3%) are male. This is because someone with a female gender who has rheumatoid arthritis is partly the result of the involvement of the hormone estrogen. This hormone stimulates autoimmunity, causing rheumatoid arthritis.

Characteristics of patients based on a pain scale of 7, the highest was in farmer workers and traders, which was a scale of 6. The results showed the highest scale of pre-test on the work of farmers and traders, namely on the highest scale. Sudden pain is usually caused by strenuous or unusual physical activity. Complaints of pain will be more severe after exercising or increase with activity and can improve with rest. Improper physical activity will exacerbate pain in people with joint pain (Nahariani et al, 2012).

Characteristics of patients before being given an intervention in education with the highest pain scale in education not in school, elementary, and junior high school with a pain scale of 6. These results show the highest scale of pre-test in respondents' education both in respondents who are not in school, elementary and high school are the same, namely pain scale 6. Theoretically, failure to treat pain in the elderly often occurs when education for the elderly and their assistance is not sufficient. Education for the elderly and their assistance in pain management is very necessary to increase the knowledge of the elderly about how to deal with their respective pains, so that the elderly who do not understand about the treatment of joint pain only need to be given education (Lase, 2015).

### **The Effect of Foot Massage Therapy and Lavender Aromatherapy on Rheumatoid Arthritis Pain Intensity in the Elderly in the Working Area of Jembatan Kecil Health Center Bengkulu City**

The results showed that the average difference in pain intensity before and after being given foot massage therapy and lavender aromatherapy was a decrease of 2. The statistical test results showed  $p\text{Value } 0.000 < 0.05$ , which means that there was a significant difference in the mean intensity of pain before and after being given foot massage therapy in patients. rheumatoid arthritis, so it can be concluded that there is an effect of foot massage therapy and lavender aromatherapy on a decrease in pain intensity for rheumatoid arthritis sufferers.

In the research of Rizki Muliani et al (2019), the results of the study concluded that there was a significant decrease in pain intensity before and after foot massage therapy was given,

$p\text{ Value } 0.000 < 0.05$ , meaning that there was an effect of pain scale before and after foot massage. Foot massage performed can complement the aging process of pain scale in the elderly. Therefore, pharmacological therapy cannot be separated, but for the use of the dose it can be adjusted to the physiological conditions of the elderly and foot massage can be used as a complementary therapy to reduce pain in the elderly.

The effect of lavender aromatherapy is useful in reducing muscle tension which will reduce pain levels, relaxation, anxiety, mood, and an increase in alpha and beta waves which show increased relaxation (Argi, 2013). In the results of research by Astuti, W, Y (2013) there is an effect of lavender aromatherapy on the intensity of pain and anxiety before and after giving lavender aromatherapy because inhaling the aroma of lavender helps you feel relaxed and creates a balance of body and mind. In a study conducted by Sari, Y, P (2014) the results of the study concluded that there was a significant change in the pain scale level of rheumatic patients (osteoarthritis) before and after being given lavender aromatherapy warm compresses to decrease the pain scale of rheumatic patients in the elderly with  $p = 0.00$  ( $p < 0.05$ ).

### **Conclusion**

The average pain intensity before being given foot massage therapy and lavender aromatherapy on the intensity of rheumatoid arthritis pain in the elderly in the working area of the Jembatan Kecil Public Health Center in Bengkulu City was 5.13. The average pain intensity after being given foot massage therapy and lavender aromatherapy on the intensity of rheumatoid arthritis pain in the elderly in the working area of the Jembatan Kecil Public Health Center in Bengkulu City was 3.07.

Foot massage can encourage nerve terminals by increasing modulation, because every movement will trigger nerves (A-beta nerves) then impulses will be sent to the central nervous

system. The control system is activated via inhibitory interneurons, whereas excitatory interneurons are inhibited, thus closing the gate and pain messages are not transmitted to the central system (Chanif, C., Petpichetchian, W., & Chongchareon, 2013). Lavender aromatherapy containing linalyl acetate and linalool is useful for reducing pain and providing a relaxing effect because it stimulates alpha waves in the brain and will inhibit blood circulation. In addition, it also has benefits as an anti-inflammatory, strong antiseptic, antiviral, and antifungal which can reduce emotions, relax, and reduce pain (Gaware, 2013).

## References

1. Amigo, Thomas Aquino Erjinyuare., et al. (2017). *Book of Clinical Skills in Elderly Nursing and Family Nursing (Gerontology And Family Nursing)*. Yogyakarta: Nuha Medika.
2. Andri, J. (2020). Level of Knowledge on Handling Rheumatoid Arthritis Disease in the Elderly. *Asekepius Public Health Journal (JKA)*. 2(1). 2684-8287.
3. Azizah, N., (2020). Inhaled Aromatherapy Lavender (*Levendula Angustifolia*) and Nerolin (*Citrus Aurantium*) With Post Partum Pain. Muhammadiyah University of Sidoarjo.
4. Central Jakarta Statistics Agency. (2019). *Elderly Population Statistics 2019*. Central Jakarta: Central Statistics Agency.
5. Bangun, A, V., & Nur'aeni, S (2013). Effect of Lavender Aromatherapy on Pain Intensity in Postoperative Patients at Dustira Cimahi Hospital. *Soediman Journal of Nursing (The Soediman Journal Of Nursing)*, Volume 8. Nursing Study Program at the College of Health Sciences General Achmad Yani Cimahi.
6. Dewi, a. P. (2013). Lavender Aromatherapy as a Relaxation Media. *E-Jurnal Medika Udayana*, 2(1),21-53. <http://ojs.unud.ac.id/index.php/eum/article/download/4871/3657>
7. Fadlilah, S., & Widayati, R, W., (2018). The Effectiveness of Shallot Compress Against Joint Pain in the Elderly. *Journal of Health*. 9(2)
8. Fallis, A. . (2013). Effect of Fasting on Blood Pressure Reduction in Elderly With Hypertension. *Journal of Nursing*, 53(9), 1689-1699.
9. Herlina., Ridwan, M., & Hetia, E, N. (2017). Effect of Lavender Aromatherapy on Reduction of Active Stage 1 Labor Pain. *Metro Sai Wawai Health Journal*. 1, 197799- 469.
10. Hermayudi., & Ariani, A, P., (2017). *Rheumatic Diseases (Rheumatology)*. Yogyakarta: Nuha Medika.
11. Hidayat, AA (2008). *Basic Skills in Clinical Practice for Midwifery*. Jakarta: Selemba Medika Ip Suraoka. Degenerative disease. Yogyakarta: Nuha Medika; 2012.
12. Langow, SS (2018). *A To Z Autoimmune Rheumatic Disease*. Jakarta: PT Elex Media Komputindo.
13. Marlina, F., & Juniarti, R. (2019). The Effect of Massage on Changes in Rheumatic Pain Intensity in the Elderly in Kertapati Village, Curup Dusun Health Center, North Bengkulu. *Journal of Nursing*. 7(2)
14. Nurhanifah, D., Ramadina, S., & Mulyani, Y. (2020). The effect of giving back massage using lavender aromatherapy on reducing pain intensity in post-laparotomy patients. 3(2).
15. Potter & Perry. (2010). *Fundamentals of Nursing: Concepts, Processes And Practice*. Issue 7. Vol. 3. Jakarta : EGC
16. Potter & Perry. (2015). *Fundamental Textbook Of Nursing*. Jakarta : EGC.
17. Putri, I, R, R., & Priyanto, S., (2019). Application of Back Massage Therapy to Reduce Pain Levels in Families with Rheumatoid Arthritis. Muhammadiyah University of Magelang.



18. Basic Health Research (Riskesdas) (2018). Indonesian Ministry of Health Research and Development Agency in 2018.
19. Rizqitah, L. (2017). Effects of Daud Fasting on Changes in Blood Pressure at Age Over 50 Years in Sleman Regency, Special Region of Yogyakarta. *Journal of Health, Islamic University of Indonesia*.
20. Setiyohadi, B., Alwi, I., & Sudoyo, A. (2006). Internal medicine textbook. Ed V Volume III. Jakarta: Interna Publishing. 1709-1713.
21. Singh, et al. 2016. "2015 American College of Rheumatology Guideline for the Treatment of Rheumatoid Arthritis". *Arthritis & Rheumatology* 68 (1):1– 26
22. Smeltzer & Bare. (2013). *Brunner Suddarth's Textbook of Medical Nursing*. Edition 8. Jakarta; EGC.
23. Susanti, E. (2017). Differences in the provision of warm compresses and massage to the intensity of pain in the elderly with joint arthritis pain at the Tresna Wedha Wargatama Social Home, Indralaya, South Sumatra. Department of Nursing, Medical Surgery, Poltekkes, Ministry of Health, Palembang.
24. Tamsuri, Anas. (2006). *Concept and Management of Pain*. Medical Book Publisher. Jakarta: EGC
25. Tedampa, RG, Mulyadi, & Bataha, YB (2016). Relationship between Body Mass Index (BMI) and Rheumatoid Arthritis at the Kampung Baru Health Center, Luwuk District, Banggai Regency. *Nursing e-journal*, Volume 4 Number 2 1-5.
26. DPP PPNI SDKI Pokja Team. (2016). *Indonesian Nursing Diagnostic Standards (1st Ed)*. Jakarta: Central Board of the Indonesian National Nurses Association. Retrieved from <http://www.inna-ppni.or.id>
27. Wahyurianto, Y., (2017). The Effect of Massage on Reducing Joint Pain in the Elderly. 10(1). 1979 – 8091