EFFECTIVENESS OF CINNAMON (CINNAMOMUN BURMAN) IN REDUCING PAIN SCALE OF GOUTY ARTHRITIS: LITERATURE REVIEW

SEMBIRING, M. N. M.

Faculty of Nursing, Universitas Sumatera Utara, Sumatera Utara, Indonesia.
e-mail: maxnurmaghribi[at]gmail.com

(Received 10th October 2024; revised 08th January 2025; accepted 15th January 2025)

Abstract. Gouty arthritis occurs when excess uric acid builds up in the body, causing joint and bone pain due to monosodium urate crystal deposits in the joints. This condition results in repeated and sudden joint pain, limiting mobility. One non-pharmacological approach to pain relief is cinnamon compress therapy, as cinnamon can suppress cytokines associated with arthritis pain. Crushed cinnamon sticks, containing essential oils (1-4%) with components like eugenol (up to 10%), cinnamaldehyde (60-80%), and phenolic compounds (4-10%), are effective for gouty arthritis treatment. These compounds, along with other active ingredients like tannins and catechins, have properties that promote vasodilation, improving blood flow and reducing pain. This article employs a literature review methodology, analyzing national and international sources related to the effectiveness of cinnamon in managing arthritis pain. National literature was sourced via Google Scholar using keywords like "Cinnamon," "Cinnamomum Burmannii," and "Arthritis Gout." International literature was obtained from ScienceDirect, ProQuest, and PubMed using the terms "Cinnamon" AND "Rheumatoid Arthritis Gout." Ten relevant articles were included in the review Cinnamon therapy has proven effective in reducing arthritis pain, with methods including warm water compresses, consuming cinnamon mixed with honey, cinnamon-based herbal medicines, supplements, and creams. The therapy is typically applied to affected areas such as the feet or knees. Further research is needed to explore the full potential of Cinnamomum Burmannii in reducing arthritis pain in Indonesia. This requires adequate resources, healthcare facilities, trained professionals, and community education to enhance understanding and implementation of cinnamon-based interventions.
Keywords: *Gouty Arthritis, Cinnamon therapy, pain, Cinnamomum Burmannii*

Introduction

Gouty arthritis was first studied by Dr. Van Den Horst in 1935. Gouty arthritis is the formation of crystals in the joints, caused by high levels of uric acid in the blood, which can cause crystal buildup that causes joint damage and pain (Munawaroh, 2018). According to Setiawan and Nur (2020), gouty arthritis is a condition where the body cannot control uric acid. Therefore, uric acid builds up in excess which causes joint and bone pain. It is concluded that gouty arthritis is joint pain that occurs repeatedly and suddenly due to the deposition of monosodium urate crystals in the joint as it is difficult to move. The global prevalence of gouty arthritis based on the calculation of Years Lived with Disability (YLDs) per 100,000 is 0.13% of the total YLDs at age 50-69 years and 0.18% of the total YLDS at age ≥70 years. Meanwhile, the lowest prevalence was in Mexico at 0.081% for ages 50-69 years and 0.083% for ages ≥70 years. According to the World Health Organization (WHO) in 2018, the number of cases of gouty arthritis in the world is 33.3% (Suriya et al., 2019). Geographically, the distribution of gouty arthritis cases is uneven and mostly experienced by the female population aged 45-65 years due to hormonal factors. The results of RISKESDAS, 2018 show that joint disease in Indonesia diagnosed by health workers is 13.5%. In Indonesia, the highest prevalence of gouty arthritis in North Kalimantan Province was 0.41% at 50-69 years and the highest age ≥70 years in North Kalimantan Province and West Papua

at 0.37%. The lowest prevalence was in Aceh and East Nusa Tenggara provinces at 0.3% within 50-69 years old. The lowest prevalence was also in Aceh, South Kalimantan, South Sulawesi, and West Sumatra at 0.28% within ≥70 years old. The number of people with gouty arthritis in North Sumatra is 1,800,000 people (14.5%) of the 12,333,974 population in 2019. The prevalence of joint disease based on diagnosis in the population ≥15 years in North Sumatra is 6.8%. Arthritis treatment is applied pharmacologically and non-pharmacologically. Several non-pharmacological treatments can overcome pain such as movement training (Antoni et al., 2020).

Gout is usually called gouty arthritis which is a degenerative disease that attacks the joints and is found in the elderly community. However, this disease is also often seen in the pre-elderly group (Rianti, 2020). The cause of gout is the accumulation of crystals which are the result of purines, where the kidneys are unable to excrete uric acid through urine, forming crystals in the joint fluid (Suryani et al., 2021). According to WHO, normal uric acid in females is between 2.4-6.0 mg/dL, and 3.0-7.0 mg/dL for males. If it exceeds the normal value, hyperuricemia will occur. This condition causes an inflammatory reaction (pain) and the occurrence of gouty arthritis. In general, patients with gouty arthritis have signs and symptoms of joint pain (Putri and Krishna, 2021). Pain is normally associated with various types of tissue damage, which is a warning sign, but the experience of pain is much more than that (Umah et al., 2020). Pain is a multidimensional experience. It can differ in intensity (mild, moderate, severe), quality (dull, burning, sharp), duration (transient, intermittent, persistent), and superficial or deep, localized or diffuse spread (Alotaibi et al., 2022). Increased levels of uric acid in the blood cause disturbances in the human body such as feelings of pain in the joint area and accompanied by soaring pain. If the pain is not treated immediately, it will interfere with daily physical activities (Wilda and Panorama, 2020).

The method usually used to reduce gouty arthritis pain is the administration of non-steroidal anti-inflammatory drugs (NSAIDs), such as profen, naproxen, and allopurinol (Wilda and Panorama, 2020). One of the non-pharmacological therapies to reduce pain is with cinnamon compresses. The compress used is hot because hot compresses respond well to pain due to gouty arthritis. Hot compresses are a simple form of action and an effective method of reducing pain. This action is channelled through conduction such as hot wet compresses (Suryani et al., 2021). Giving hot compresses can reduce pain and is combined with cinnamon. Hence, the results are more effective (Pattiradjawane, 2017). Cinnamon can suppress cytokines associated with arthritis pain (Arianto, 2018). Non-pharmacological alternative medicine that is often used in the community is the cinnamon plant. Mashed cinnamon sticks can be used for the treatment of patients with gouty arthritis. Where cinnamon contains essential oils (1-4%) containing eugenol (up to (10%), cinnamaldehyde (60-80%), cinnamic acid trans (5-10%), phenol compounds (4-10%), tannin, catechin, oxalate, gum, resin, sugar and coumarin (Nofia et al., 2021). The essential oil contained in cinnamon is hot which modulates blood vessels so that blood flow to the painful area increases which can reduce pain (Nurhayati and Yusoff, 2022). The purpose of this study was to determine the effectiveness of cinnamon in reducing pain intensity in patients with Gouty Arthritis through a review of various literature (literature review). From the various information that has been obtained, the author is interested in researching "The Effectiveness of Cinnamon (Cinnamomum Burman) as an Effort to Reduce the Pain Scale of Gouty Arthritis".

Materials and Methods

The writing of this article uses the Literature Review Study approach by searching for literature related to the theme taken to review and analyze national and international literature. National Journal literature searches use searches through Google Scholar with the keywords "Cinnamon" "Cinnamomun Burman" and "Gouty Arthritis". As for the International Journal Literature Search through ScienceDirect, Proquest, and PubMed with the keywords "Cinnamon" AND "Rheumatoid Arthritis Gout" This literature search is limited to the range of 2018-2023. Then from the results of the literature search, journals are open access and easy to download, journals contain interventions to reduce arthritis pain with cinnamon, full article journals, the authors get ten articles that match the criteria made by the author, namely using quantitative research methodology with descriptive and experimental approaches to see the effectiveness of cinnamon in the scope of the community or hospital. Data collection was done by manually extracting according to the inclusion criteria and keywords. Therefore, a total of 1,410 articles were obtained. Articles that are relevant to the literature review are 10 articles. The steps in writing the literature review are described systematically as follows (*Table 1* and *Figure 1*).

Table 1. *Literature Review.*

Author/year/title	Purpose	Methodology	Sample	Main results
Hartutik and Gati (2021): Pengaruh Kompres Kayu Manis (Cinnamomun Burman) Terhadap Nyeri Arthritis Gout Pada Lansia.	Determining the effect of cinnamon compress on reducing the pain scale in patients with Gouty Arthritis in the Elderly	Quasy experiment with the research design used is a pre-postest control one group design.	The sampling used in this study was non-probability sampling in a purposive sampling technique with a sample size of 22 people.	Based on research shows that the majority of respondents who experience Gouty Arthritis pain are elderly and female. The pain scale after being given a cinnamon compress becomes mild. There is an effect of cinnamon compress on the pain scale of Gouty Arthritis after being given a cinnamon compress.
Antoni et al. (2020): Pengaruh Penggunaan Kompres Kayu Manis terhadap Penurunan Skala Nyeri pada Penderita Arthritis Gout di Wilayah Kerja Puskesmas Batunadua.	Determining the effect of using cinnamon compresses (cinnamomum burmani) on reducing the pain scale in the Batunadua Health Centre work area in 2019.	Quasy exsperiment with the one group pretest-posttest design.	The sample used in this study was 13 respondents	The results of the study through the Wilcoxon statistical test showed the effect of using cinnamon compresses on reducing the pain scale in patients with gouty arthritis with a p-value of $0.001 < \alpha$ (0.005).
Febriyona et al. (2023): Pengaruh kompres kayu manis terhadap nyeri gout arthritis pada lanjut usia di Desa Tihu Kecamatan Bonepantai.	Determining the effect of cinnamon compress on gouty arthritis pain in the elderly in Tihu Village, Bone Pantai Subdistrict.	Quasi-experimental Research design with non-equivalent control group.	The sample size was 30 people with purposive sampling as the sampling technique.	The results of the study of pain levels before the treatment group were moderate pain in as many as 15 elderly (100%) and the control group was moderate pain in as many as 15 elderly (100%). The level of pain after the cinnamon compress in the treatment group was the majority of mild pain as many as 12 elderly (80%) and the level of pain in the control group was the

				majority of moderate pain as many as 11 elderly (73.3%). The statistical test results of the treatment group obtained a p-value of 0.000 and a control group p-value of 0.054. There is an effect of cinnamon compress on gouty arthritis pain in the elderly.
Nurhayati and Umarianti (2018): Therapy of cinnamon decoction using honey in reducing gout.	To analyze cinnamon decoct therapy with honey to reduce uric acid for people with gout.	Quasi-experiment with pre and post-test design.	The sample consisted of 50 people with gout conducted at Gambirsari Health Center, Kadipiro District, Mojosongo, Surakarta, Central Java, in May 2018.	Uric acid in the cinnamon decoction group with honey was lower than the control group and the honey group was statistically significant (p = 0.023). Cinnamon decoction with honey can reduce uric acid levels in patients with gout.
Fitriani and Supriyadi (2020): Effectiveness of ginger and cinnamon compresses on pain in elderly with osteoarthritis.	Determining the effectiveness of ginger and cinnamon compresses on reducing pain in elderly people with osteoarthritis at Sudagaran Orphanage.	A quasi-experimental design with two group pretest and post-test design.	The sampling technique used was random sampling with 15 respondents getting ginger compresses and 15 respondents getting cinnamon compresses.	Data were analyzed using univariate and bivariate with the Whitney U Test. The results of the Mann Whitney U Test on both post-therapy obtained differences in the value of ginger compress with p = 0.417 and differences in the value of cinnamon compress comfort with p = 0.127. After calculating the size effect, the effect of ginger size is 0.924 while the effect of cinnamon size is 0.790. The use of ginger compress is more effective than cinnamon compress in reducing pain in elderly people with osteoarthritis at Sudagaran Health Center.
Rambod et al. (2018): The prevalence and predictors of herbal medicines usage among adult rheumatoid arthritis patients: A case-control study.	To evaluate the prevalence and predictors of herbal medicine use among community-based adult Rheumatoid Arthritis (RA) patients.	Cross-sectional case-control study.	The case group included 500 RA patients and the control group contained 500 individuals.	51.4% of subjects in the RA group and 36.4% in the control group used herbal medicine. The most widely used herbal medicines were thyme (43.4%), chamomile (36.9%), borage (36.8%), lavender (31.2%), ginger (28.5%), and cinnamon (21.5%) among RA patients. The results showed significant differences between the two groups concerning the use of herbal medicines, such as chamomile, cinnamon, and ginger. In addition, the results of logistic regression analysis on RA patients showed that men (odds ratio = 0.50,

				p = 0.001) used fewer herbal medicines compared to women. In addition, married RA patients (odds ratio = 0.35, p = 0.03), illiterate (odds ratio = 2.45, p = 0.001), and those with high school education (odds ratio = 1.64, p = 0.02) used more herbal medicines compared to other patients.
Shishehbor et al. (2018): Cinnamon consumption improves clinical symptoms and inflammatory markers in women with rheumatoid arthritis.	Determining inflammatory markers, and cardiovascular risk factors in women with rheumatoid arthritis (RA).	Randomized double-blind clinical trial.	36 women with rheumatoid arthritis (RA).	There was a significant reduction in serum levels of CRP (p < 0.001) and TNF-a (p < 0.001) in the cinnamon group compared to the placebo group. Blood diastolic pressure was also significantly lower in the intervention group compared to the control group (p D 0.017). Compared to placebo, cinnamon intake significantly reduced Disease Activity Score (DAS-28) (p < 0.001), Visual Analog Scale (VAS) (p < 0.001), and tender (TJC) (p < 0.001) and swollen joints (SJC) (p < 0.001) were calculated. No significant changes were observed for FBS, lipid profile, liver enzymes, or ESR.
Hassani et al. (2020): The Effect of Eight Weeks of Hand-Selected Strength Exercises and the Cinnamon Supplementation on Inflammatory Biomarkers in Elderly Women with Osteoarthritis.	To investigate the effects of eight weeks of selected exercises with Hand exercises and cinnamon supplementation on inflammatory biomarkers in elderly women with osteoarthritis.	Quasi-experimental research with pre-test and post-test design with control group.	48 women with hand osteoarthritis.	A dependent t-test was used to compare pre and post-tests and the ANOVA test to compare TNfα and IL6 levels between the four groups. Significance level P ≤ 0.05 was considered and showed that applying the variables of strength training and cinnamon-honey supplements as well as the combination of exercises and supplements had positive effects on inflammatory biomarkers and in fact, 8 weeks of resistance training and the use of cinnamon-honey supplements in women with hand osteoarthritis have led to a decrease in IL6 and TNfα levels.
Peivastegan et al. (2020): Comparing the effects of oleoresin of Pistacia atlantica tree and diclofenac gel on the knee osteoarthritis	To evaluate the effect of P. atlantica oleoresin topical cream on pain relief in patients with Osteoarthritis.	Cross-sectional with quantitative research.	This clinical trial was conducted on 84 patients with knee OA (grade 2 or 3) in parallel for three months, and diclofenac gel was used as the control drug at the same time.	A trend towards improvement was observed in both groups. Patients receiving P. atlantica cream experienced significant improvement with a

improvement.				higher rate of symptom improvement than those receiving diclofenac gel ($P < 0.05$). P. atlantica cream significantly reduced pain and joint stiffness in patients while performing daily activities.
Ahmadi et al. (2020): The effect of chickpea broth on knee osteoarthritis-A Pilot non-randomised open-labeled clinical study.	To assess the effect of Persian food on osteoarthritis symptoms.	Non-randomized open-label pilot clinical study.	140 Patients with a diagnosis of osteoarthritis.	Cinnamon consumption was associated with pain improvement, with a statistically significant reduction in pain scores detected after 30 days ($p = 0.005$). Significant improvements in three of the five quality-of-life domain scores were also reported at the same time point ($p = 0.04$). The findings of this pilot study reveal promising effects of Cinnamon on pain and quality of life in osteoarthritis patients.

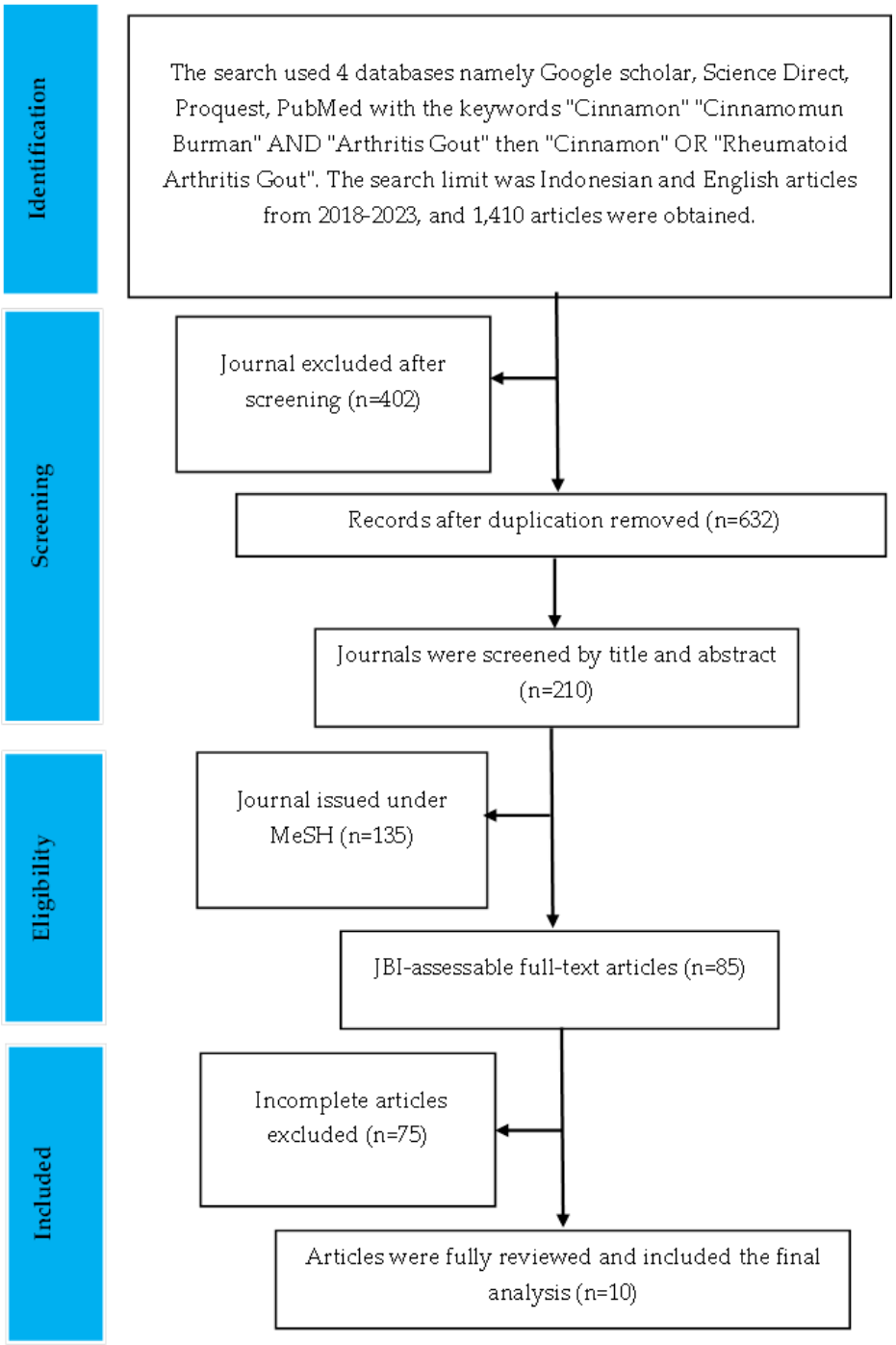

Figure 1. *Modified by Prisma.*

Results and Discussion

The main result of this section is to identify the effectiveness of Cinnamon (Cinnamomun Burman) as an effort to reduce the pain scale of gouty arthritis. The authors have searched for articles and reviewed them through a screening process and eligibility test using the JBI critical appraisal tools. Thus, ten research articles related to this literature review were obtained. In the first journal, the pain scale felt by the elderly was measured using NRS (Numerical Rating Scale). The results showed that the

characteristics of respondents based on age who experienced Gouty Arthritis pain were mostly elderly. The gender of the elderly who experience Gouty Arthritis is mostly female. The pain scale of the elderly suffering from Gouty Arthritis before cinnamon compresses in the treatment group with moderate pain. While the pain scale of the elderly suffering from Gouty Arthritis in the control group with moderate pain scale. The pain scale of the elderly suffering from Gouty Arthritis after cinnamon compresses in the treatment group with a mild pain scale. The pain scale of the elderly suffering from Gouty Arthritis in the control group with a moderate pain scale. There is an effect of cinnamon compress on the pain scale of Gouty Arthritis in the treatment group after being given cinnamon compress, after the Wilcoxon test. To analyze the difference in the effect of cinnamon compress on pain in patients with Gouty Arthritis in the treatment group and control group before and after treatment using the Mann-Whitney test.

The same results were found in the second journal, Cinnamon Compress was given for 1 week to each respondent. A pretest was done before giving the cinnamon compress and the posttest was given after a week of giving the cinnamon compress. The measuring instrument used in this study is the Numeric Rating Scale (NRS). The results of the Wilcoxon test on the comparison of the pain scale before and after applying cinnamon compress showed that there was a significant change with a value of $p=0.001$ ($p<0.05$). In the third journal, the research instruments used were pain level observation sheets, cinnamon compress SOP, and dependent t-tests as data analysis. The results showed that the pain level before the treatment group's cinnamon compress was moderate. While the pain level before the control group was moderate. The level of pain after the cinnamon compress in the treatment group was mild and the level of pain after the control group remained at a moderate level of pain. There is an effect of cinnamon compress on gouty arthritis pain in the elderly in Tihu Village, Bone Pantai District. In the fourth Journal, in the control group, Allopurinol 100 mg was given for 1 week, at a dose of 1 time per day. Data were analyzed by Wilcoxon and Mann-Whitney tests. The result was that the uric acid of the cinnamon honey decoction group was lower than the control group and was statistically significant ($p=0.023$). This study did not involve the BMI of the respondents, so the concentration used was 15% given to respondents and not classified based on BMI. Respondents in this study were not under the supervision of a doctor or in a condition of having a complex disease.

The fifth journal applies quantitative research with a quasi-experimental design with a two-group pretest-post-test design consisting of two treatments. Random sampling was used to collect data in this study. Respondents in this study were divided into 2, namely 15 respondents who were given boiled ginger compress for 20 minutes and 15 respondents who were given boiled cinnamon compress for 20 minutes. The research was conducted in January 2020 at Sudagaran Nursing Home with a Mann-Whitney test analysis. The results of the study from a total of 15 respondents on joint pain levels before being given cinnamon compresses, showed that most respondents (67%) experienced moderate pain. Meanwhile, mild pain was felt by 33% of respondents. The level of joint pain after being given a cinnamon compress showed that 80% of respondents felt mild pain and 20% of respondents felt moderate pain. It is concluded that there is an effect of cinnamon compresses on changes in joint pain levels in the elderly. The results showed that the average pain scale before the intervention was 6.92 with a mean difference of 2.07, a standard deviation of 0.954 with a minimum value of 5 and a maximum value of 8. Meanwhile, the pain scale after the intervention obtained

an average value of 4.85. In the sixth Journal, the case group included 500 RA patients and the control group consisted of 500 control individuals selected through convenience sampling. Case group participants were selected from three rheumatology clinics in Hafez, Motahari, and Imam Reza centres affiliated with Shiraz University of Medical Sciences. Control group participants were also selected from surgical and orthopaedic clinics in the Motahari Centre. The chi-square test was used to compare RA and control groups concerning qualitative variables. The study was based on other diseases or medical problems that were considered as covariates that might impact the use of herbal medicines. Therefore, ANOVA was used. In addition, logistic regression analysis was used to determine predictors of herbal medicine use in RA patients. This study showed that 51.4% of subjects in the RA group and 36.4% in the control group used herbal medicine. The most common herbal medicines used by RA subjects were thyme, chamomile, borage, lavender, ginger, and cinnamon. In addition, men used fewer herbal medicines than women. In addition, married RA patients used more drugs compared to divorced patients.

The seventh journal used statistical analysis to examine the normal distribution of all data through the Kolmo groove-Smirnov test. Results are presented as means. Independent sample t-test and Mann-Whitney test were used for parametric or nonparametric data, respectively, in comparing differences between the two groups. Paired t-test (for parametric data) and Wilcoxon test (for nonparametric data) were used to assess differences between weeks 0 and 8 in each study group. Analysis of covariance adjusted for baseline values and menopausal status, to compare the two groups at the end of the study. The results suggest a beneficial effect of cinnamon supplementation on improved disease activity and inflammatory biomarkers in RA. The findings showed that cinnamon administration at 2000 mg/day for 8 weeks resulted in a significant reduction in serum TNF, CRP, the number of Udem joints, and blood pressure in women with RA. Regarding the availability and lack of side effects, regular intake of cinnamon supplements can be used as a pharmacological agent in the treatment of RA. The capsule count confirmed good compliance, 90.86% in the cinnamon group and 91.51% in the placebo group. In addition, no side effects were reported, only one patient in the cinnamon group reported mild gastric discomfort. The Eighth Journal conducted an 8-week hand-strength training intervention. In this group, standard hand-strengthening exercises were performed using simple tools. The second group used honey and cinnamon powder supplements twice daily for 8 weeks. The third group also received hand selection exercises with cinnamon and honey supplements simultaneously. The fourth group also participated in the study without any exercises or supplements and as a control group. Patients' TNfa and IL6 levels were measured before and after applying the independent variables, and then compared with each other. In this study, the ANOVA test was used to investigate differences between groups. Comparison between the groups in all variables at pre-test showed that there were no significant differences between the groups (strength training, cinnamon-honey supplement, combination, and control groups). However, a comparison between the four groups at the post-test showed that there were significant differences between the four groups at this stage. Tukey's test at 0.05 was used to investigate the differences between groups. Tukey's post hoc test for the variable TNfa showed that there was a significant difference between the four groups at the post-test. This means that strength training with the use of cinnamon-honey supplements and their combination was able to reduce TNfa (pg/mL). Tukey's post hoc test for IL6 showed that there was no significant

difference between the strength training groups with cinnamon and honey supplements at the post-test phase. There were also significant differences between the strength training, combination, control, and other groups.

The Ninth Journal studied based on two groups: (1) patients treated with P. atlantica cream and (2) patients treated with diclofenac gel. Both drugs were administered three times a day at a dose of 2 g. In the P. atlantica cream group, 2 g of cream was applied on the inner knee three times a day while being massaged, then the subjects were asked to adhere to the treatment for three months. They were also asked to come to the clinic to receive the cream and follow the treatment process at specific times (at 2, 6, and 12 weeks after entering the treatment process), and call the announced phone number for further details. To evaluate the treatment process, the WOMAC (The Western Ontario and McMaster Universities OA Index) questionnaire was completed by patients at the start of treatment. The collected data have been analyzed in Microsoft Excel 2016 software and SPSS version 19 to determine descriptive statistics, chi-square test analytics, and ANOVA. The result is that P. atlantica cream containing oleoresin in combination with other systemic medications or not, can reduce pain, inflammation, and restriction of joint movement in patients with mild to moderate knee OA (grade 2 and 3). The anti-inflammatory activity of P. atlantica cream is due to its analgesic effect that inhibits several enzymes involved in inflammation caused by OA. Based on research, the most common OA problem is joint stiffness which reduces the patient's ability to perform daily activities. This can be reduced by topically administering P. atlantica cream which can be used as an alternative to other drugs such as diclofenac which has little side effects. In the tenth journal, a paired t-test with the Friedman test was used to assess differences between measurements. The significance level for all tests was set at $p<0.05$. The result is that a Warm Water Compress using Cinnamon is a simple, acceptable and inexpensive treatment option for OA. This study has shown that Warm Water compress using Cinnamon may contribute to the improvement of knee OA symptoms and quality of life. These findings support the conduct of larger and more definitive trials of Cinnamon for knee OA. This section will explain the effectiveness of Cinnamon (Cinnamomun Burman) in reducing the pain scale of gouty arthritis. After searching for research articles and reviewing articles through the simplified thematic approach method and eligibility test using the JBI critical appraisal tools, ten research articles related to this literature review were obtained. The following is a discussion of the findings of each research article that the author encountered. In addition to the main theme, five subthemes can be found in the ten articles.

Warm water compress

Of the ten research articles that the authors analyzed, there were several variations in the selection of interventions for reducing arthritis pain. As in the first journal, the tools and materials used are cinnamon powder (+15 grams), water to boil cinnamon as much as 200 cc, small towels, and basins. The way to make a compress is to boil cinnamon powder until it boils, then put it in a basin. Next, put a towel and ready to be used for compress. The water is not too hot when 15-20 minutes. In the second journal almost the same, the tools and materials used in this study are cinnamon powder (+15 grams), water to boil cinnamon as much as 200 cc, small towels, and basins. The way to make a compress is to boil cinnamon powder until it boils and then put it in a basin. Next, add a towel and it is ready to be used for compresses when the water is not too hot. In the third journal, the study was conducted while the respondents were sitting, preparing a

comfortable environment and giving cinnamon compresses to the treatment group. Then, the pain level was measured before and after in both groups. The results of the analysis used unpaired t-tests because the data were normally distributed. The p-value is 0.000, meaning that there is a difference between the level of pain before and after in the treatment group and the control group. The results state that cinnamon compresses are effective in reducing gouty arthritis pain in the elderly in Tihu Village, Bone Pantai District.

The Fifth Journal explains that the effectiveness of warm compresses increases blood flow to obtain analgesic effects and soothe muscles. Thus, the inflammatory process is reduced. Ginger compress can be combined with the addition of ginger and cinnamon. Ginger has spicy, bitter, and aromatic oleoresin properties such as zingeron, gingerol, and shogaol. Oleoresins have strong anti-inflammatory and antioxidant potential. Ginger compress reduces joint pain at the transduction stage, where at this stage ginger contains gingerol which contains cyclooxygenase which can inhibit the formation of prostaglandins as pain mediators. Therefore, joint pain will be reduced. Consequently, ginger can be used as an alternative non-pharmacological treatment to reduce pain. The tenth journal conducted a study on changes in knee pain after compressing with warm water using Cinnamon. There was a statistically significant reduction in VAS pain scores (p=0.005) and KOOS pain scores p=0.002) observed after 30 days. Improvements in functional status were also evident at 30 days, including a statistically significant decrease in KOOS function in daily life score (p=0.01) and KOOS function in sports and recreation score (p=0.005). Statistically significant improvements also occurred in KOOS symptom scores (p<0.001) and KOOS scores (p=0.0001). Then in changes in respondents' quality of life, there was a statistically significant increase in the KOOS QoL score (p=0.002) and WHOQOL BREF total score (p=0.006) after 30 days of soaking warm water compresses using Cinnamon on the knee. Significant improvements in three WHOQOL BREF domain scores were also observed after 30 days, including changes in physical (p=0.04), psychological (p=0.003) and general health (p=0.002) domain scores. Changes in social health and environmental health domain scores did not reach statistical significance.

Consuming Cinnamon concoction using honey

In the fourth journal, decocta is made by heating 15 grams of cinnamon simplisia in 100 cc water in a saucepan at 900C for 30 minutes. Strain with flannel cloth and let stand until warm, then mix with 1 tablespoon of honey and ready for consumption. Therapy is carried out for 1 week with a dose of use once a day. In addition to cinnamon decocta, honey is an ingredient that contains antioxidants derived from flavonoids, phenolic components, vitamin C, amino acids, enzymes, catalase and others.

Taking Cinnamon herbal medicine

In the sixth journal, data were collected using a demographic and clinical characteristics form, including information on age, gender, education level, marital status, and history of illness or medical problems. In addition, they were asked, "What supplements do you use or have you used in the past (vitamin E, vitamin D, calcium, zinc sul, and ferrous sulphate)". In addition, the pattern of herbal medicine use was assessed with a questionnaire. In this questionnaire, respondents were asked to answer the following questions: "Do you use herbal medicines? (Yes No)", "What kind of

herbal medicines do you take?", "How often do you take each herbal medicine?", "How many herbal medicines do you currently take?". The results proved that there was a significant difference between RA and control groups regarding the use of herbal medicines, such as chamomile, cinnamon, and ginger. Based on the results of the chi-square test, the percentage of chamomile use was lower in the RA group compared to the control group ($p=0.04$). However, the percentage of cinnamon and ginger use was higher in RA compared to the control group ($p<0.05$). The most frequently used herbal remedies among RA patients were thyme (43.4%), chamomile (36.9%), borage (36.8%), lavender (31.2%), ginger (28.5%), and cinnamon (21.5%).

Taking Cinnamon supplements

Furthermore, the seventh journal discusses cinnamon supplement medicine in arthritis patients. Cinnamomum Burman bark was purchased from the local market (Ahvaz, Iran) with Chinese made, and identified by the pharmacognosy and medicinal plants research center, Faculty of Pharmacy, Ahvaz Jundishapur University of Medical Sciences. Cinnamon bark was ground into fine powder. Cinnamon and placebo capsules and containers were completely identical. Every day the patients were reminded about capsule intake and questioned about possible side effects. They were asked to avoid changes in diet and physical activity for 8 weeks and to refrain from cinnamon foods and all cinnamon-containing ingredients (cinnamon tea). Patients were evaluated by counting the number of capsules remaining. The result was that there was no significant difference in daily energy and nutrient intake between the cinnamon and placebo groups at the beginning and end of the study. The serum TNF-a level decreased significantly in the cinnamon group at the end of the study. The serum CRP level decreased significantly after cinnamon capsule intake, while a significant increase occurred in the placebo group. At the end of the study, a significant difference was found between the 2 groups ($p<0.001$). Similar to the eighth journal, the hand-strength training intervention was conducted for 8 weeks as suggested by Hennig et al. In this group, standardized hand-strengthening exercises were performed using simple tools. Both groups were supplemented with honey and cinnamon powder twice daily for 8 weeks. The third group also received hand exercises with cinnamon and honey supplements simultaneously. The fourth group also participated in the study without any exercises or supplements and as a control group. According to Hennig et al. the dosage of honey and cinnamon is two tablespoons of honey daily (every morning) with one teaspoon of cinnamon dissolved in a cup of water.

Using medicinal cream from the Cinnamon tree

In the ninth journal, the oil phase mixture initially included castor oil (as an adsorption enhancer), acetyl alcohol (as a stabilizer), stearic acid (as an oil phase constituent and stabilizer), and glycerol mono-stearate (as an emulsifier). Then, the formulated cream was made by mixing the oil phase and heating it at 70°C. Next, the solution was mixed with the aqueous phase, and the temperature was raised to 75°C. Mixing continued with agitation and adding triethanolamine, and stirring continued until the cream was gradually cooled. The preservative component is added at the end of the process. Then the cream was applied on both knees of the patient who had arthritis pain.

Conclusion

Based on the literature review that has been done, it can be concluded that therapy using cinnamon (Cinnamomun Burman) is very effective for reducing the arthritis pain scale. Several ways can be used in therapy using cinnamon, including warm compresses, consuming cinnamon concoctions mixed with honey, consuming cinnamon herbal medicines, taking cinnamon supplements, and using medicinal creams from cinnamon trees. This method can be done on the foot area or both knees. Based on the previous explanation, it is evident that further in-depth intervention or research is needed on the effectiveness of Cinnamon (Cinnamomun Burman) in reducing the arthritis pain scale in Indonesia to the maximum. Certainly, several things must be prepared such as human resources, health care facilities, health workers, continued education among the community, and sufficient knowledge. This is based on a code of ethics and a governing body.

Acknowledgement

This research is self-funded.

Conflict of interest

The authors confirm that there is no conflict of interest involve with any parties in this research study.

REFERENCES

[1] Ahmadi, N., Mokaberinejad, R., Saeidi, A., Zandi, A., Leach, M.J., Pasalar, M. (2020): The effect of chickpea broth on knee osteoarthritis-A Pilot non-randomised open-labeled clinical study. – Advances in Integrative Medicine 7(3): 121-125.

[2] Alotaibi, A.H.M., Alotaibi, A.H.M., Alotaibi, A.M.H., Alwahbi, E.B., Alkhathlan, M.S., Alnaddah, S.M. (2022): Job satisfaction among primary healthcare workers in Saudi Arabia and associated factors: A systematic review. – Family Medicine and Primary Care: Open Access 63p.

[3] Antoni, A., Pebrianthy, L., Harahap, D.M., Suharto, S., Pratama, M.Y. (2020): Pengaruh Penggunaan Kompres Kayu Manis terhadap Penurunan Skala Nyeri pada Penderita Arthritis Gout di Wilayah Kerja Puskesmas Batunadua. – Jurnal Kesehatan Global 3(1): 26-31.

[4] Arianto, Y. (2018): 56 Makanan Ajaib dan Manfaatnya untuk Kesehatan dan Kecantikan. – Bogor: Venom Publisher 180p.

[5] Febriyona, R., Sudirman, A.N.A., Utina, M.R. (2023): Pengaruh kompres kayu manis terhadap nyeri gout arthritis pada lanjut usia di Desa Tihu Kecamatan Bonepantai. – Jurnal Rumpun Ilmu Kesehatan 3(1): 87-95.

[6] Fitriani, N., Supriyadi, S. (2020): Effectiveness of ginger and cinnamon compresses on pain in elderly with osteoarthritis. – Proceedings Series on Health & Medical Sciences 1: 15-19.

[7] Hartutik, S., Gati, N.W. (2021): Pengaruh Kompres Kayu Manis (Cinnamomun Burman) Terhadap Nyeri Arthritis Gout Pada Lansia. – Jurnal Ilmu Keperawatan Komunitas 4(2): 40-51.

[8] Hassani, S., Delavare, S.H., Safikhani, H. (2020): The Effect of Eight Weeks of Hand-Selected Strength Exercises and the Cinnamon Supplementation on Inflammatory

Biomarkers in Elderly Women with Osteoarthritis. – Journal of Clinical Research in Paramedical Sciences 9(2): 6p.

[9] Munawaroh, S. (2018): Pengaruh Penggunaan Kompres Kayu Manis (Cinnamomum Burmani) Terhadap Penurunan Nyeri Penderita Arthitis Gout. – OM FKp 15p.

[10] Nofia, V.R., Apriyeni, E., Prigawuni, F. (2021): Pendidikan Kesehatan Tentang Arthritis Gout Di Puskesmas Dadok Tunggul Hitam Padang. – Jurnal Abdimas Saintika 3(1): 130-137.

[11] Nurhayati, D.R., Yusoff, S.F. (2022): Herbal dan Rempah. – Scopindo Media Pustaka 156p.

[12] Nurhayati, Y., Umarianti, T. (2018): Therapy of cinnamon decoction using honey in reducing gout. – Indonesian Journal of Medicine 3(3): 124-128.

[13] Pattiradjawane, B. (2017): Cerita Dapur Nusantara dalam Rasa & Rupa. – Gramedia Pustaka Utama 148p.

[14] Peivastegan, M., Rajabi, M., Arani, H.Z., Olya, M., Atashi, H.A., Abolghasemi, S. (2020): Comparing the effects of oleoresin of Pistacia atlantica tree and diclofenac gel on the knee osteoarthritis improvement. – Shiraz E-Medical Journal 21(10): 8p.

[15] Putri, M.A., Krishna, L.F.P. (2021): Asuhan Keperawatan Keluarga Dengan Artritis Gout. – Buletin Kesehatan 5(1): 31-43.

[16] Rambod, M., Nazarinia, M., Raieskarimian, F. (2018): The prevalence and predictors of herbal medicines usage among adult rheumatoid arthritis patients: A case-control study. – Complementary Therapies in Medicine 41: 220-224.

[17] Rianti, M.S. (2020): BENEFITS OF CINNAMON CONSUMPTION IN PATIENTS WITH GOUT ARTHRITIS. – Ibnu Sina: Jurnal Kedokteran dan Kesehatan-Fakultas Kedokteran Universitas Islam Sumatera Utara 19(2): 63-68.

[18] Setiawan, M.T., Nur, H.A. (2020): Pemberian Kompres Kayu Manis Untuk Menurunkan Nyeri Penderita Arthritis Gout di Wilayah Puskesmas Jepang Kecamatan Mejobo Kabupaten Kudus. – Jurnal Profesi Keperawatan (JPK) 7(2): 134-146.

[19] Shishehbor, F., Rezaeyan Safar, M., Rajaei, E., Haghighizadeh, M.H. (2018): Cinnamon consumption improves clinical symptoms and inflammatory markers in women with rheumatoid arthritis. – Journal of the American College of Nutrition 37(8): 685-690.

[20] Suriya, M., Ners, M.K., Zuriati, S.K., Ners, M.K. (2019): Buku Ajar Asuhan Keperawatan Medikal Bedah Gangguan Pada Sistem Muskuloskeletal Aplikasi NANDA NIC & NOC. – Pustaka Galeri Mandiri 192p.

[21] Suryani, S., Sutiyono, S., Pistanty, M.A. (2021): Pengaruh pemberian kompres larutan jahe terhadap nyeri asam urat di Posyandu Lansia Melati Desa Candisari. – Jurnal Keperawatan dan Kesehatan Masyarakat Cendekia Utama 10(1): 17-25.

[22] Umah, K., Rahmawati, R., Pratiko Gustomi, M., Yunita, N. (2020): Efektifitas kompres hangat rebusan jahe dan kayu lansia mengalami asam urat. – Journals of Ners Community 11(2): 257-264.

[23] Wilda, L.O., Panorama, B. (2020): Kompres Hangat Jahe Terhadap Perubahan Nyeri Pada Lansia Dengan Artritis Gout. – Journals of Ners Community 11(1): 28-34.