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The Effect of Foot Massage and Warm Water Mixed with Aromatic Ginger Foot Bath on Edema in Pregnancy

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ABSTRACT

Swelling or edema in the legs often occurs in third-trimester pregnant women because uterine pressure inhibits venous return causing fluid retention. The incidence of edema in RSIA Kemang Medical Care between December 2021 and January 2022 was third ranked in cases of discomfort for pregnant women. Handling swollen feet by means of complementary therapies, one of which is a foot massage and warm water foot bath mixed with aromatic ginger. This quasi-experimental study used a two-group pretest and posttest with a control group design. The population of this study was all registered pregnant women with third-trimester edema which was 80 people. There are 20 experimental samples and 20 control samples. The sampling technique used purposive sampling. The instrument was SOP and pitting scale tables. Data analysis had been done by using Wilcoxon and Mann-Whitney tests. The average degree of leg edema was 3+ before the intervention and 1+ after the intervention. According to Wilcoxon, the results showed p value =0.000 (<0.05) so statistically there was a significant decrease in leg edema before and after foot massage and footbath in warm water mixed with aromatic ginger in third-trimester pregnant women. The Mann-Whitney test for the significant difference p = 0.000 < 0.05 there was a difference between the post-experimental group and the post-control group, which means that statistically there was a decrease in swelling in the third trimester of RSIA Kemang Medical Care 2022 with foot massage intervention and warm water with aromatic ginger foot bath for pregnant women. There is a need to apply foot massage and warm water with an aromatic ginger foot bath to decrease edema cases in pregnancy as it is a complementary therapy.

Keywords: foot edema; pregnant women; foot massage

INTRODUCTION

Every pregnant woman expects a healthy and comfortable pregnancy without complications in pregnancy, because every pregnant woman is at risk of death. The way to reduce the risk is to increase the degree of health of pregnant women to childbirth (Novelia & Anisah, 2021). The target of the SDGs (Sustainable Development Goals) is to ensure a healthy life and improve well-being for all people of all ages by reducing (AKI) maternal mortality to 70 per 100,000 live births by 2030 (WHO, 2015). The discomfort of third trimester pregnancy includes frequent urination of about 50%, vaginal discharge 15%, constipation 40%, flatulence 30%, edema (swelling) legs 20%, leg cramps 10%, headache 20%, striae gravidarum 50%, hemorrhoids 60% and back pain 70% (Famela, 2016). Leg edema or swelling of the legs is found in about 80% in pregnant women in the third trimester, occurs as a result of uterine suppression which results in inhibiting backflow to the veins and the pull of gravity causes large fluid retention. The impact of leg edema on pregnant women can show signs of danger in pregnancy such as pre-eclampsia.

Leg edema is a problem in pregnancy causing activity restrictions for pregnant women (Muntean, Trenkwalder, & Bartl, 2021). The increasing weight of the growing uterus results in a pressure on pelvic veins and on the inferior vena. This increases blood pressure in leg veins leading to venous insufficiency and also leg edema. Leg edema can affect around 80% of pregnant women and should not be considered a sign of pregnancy-induced hypertension or preeclampsia (Bamigboye & Smith, 2007). The most common symptom of edema is the experience pain, as well as night cramps, numbness, and tingling. In addition, legs may feel heavy and achy and possibly be unsightly. Symptoms tend to worsen after long periods of standing and with each successive pregnancy. Edema is dangerous for pregnant women because it can cause disorders of the heart, kidneys and so on, causing the body's organs not to function properly (Putra & Ega, 2019). The procedure of the feet with physiological edema is to avoid the use of tight clothing so

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as to interfere with the backflow of veins, mobilization by changing positions a lot, do not stand for a long period of time, do not put items on the thigh because it can inhibit blood circulation, sleeping position on the left side to maximize blood vessels in both legs, do pregnant gymnastics, and recommend foot massage or foot massage, and hydrotherapy or soak the feet in warm water (Davison, 1997). Since treatments to decrease common discomforts of pregnancy such as edema should not threaten the mother and fetus, many midwives and pregnant women seek complementary therapies such as massage therapy (Clayton et al., 2018). A nonpharmacological intervention that is quite popular among healthcare providers is foot massage (Wang, Tsai, Lee, Chang & Yang, 2008). The technique in leg and foot edema works by moving extravascular fluid without disturbing intravascular fluid (Watanabe, Koshiyama, & Yanagisawa, 2017), increasing peripheral blood flow, boosting oxygen, and therefore reducing edema (Richards, Gibson, & Overton-McCoy, 2000).

According to data from RSIA Kemang from December 2021 to January 2022, 359 people visited. Data obtained there are 96 people (26.7%) of pregnant women experiencing swollen legs (edema) and 100% of pregnant women experiencing physiological swelling. Edema occurred in the second trimester which consisted of 16 people (16.6%) and the third trimester which consisted of 80 people (83.3%) (Astuti, 2011). It is crucial to note that in pregnant women, the use of any treatment methods to reduce the symptoms associated with lower extremity edema needs an examination and knowledge of the indications and contraindications related to the method. The purpose of the research to see the effect of foot massage and warm water mixed with aromatic ginger foot bath among pregnant women with edema in RSIA Kemang Medical Care in 2022.

METHOD

This type of research uses a two-group post-test design where experiments (pseudo-experimenters), this study used observation sheets and table pitting to find out the degree of swelling in pregnant women. The location of this research was carried out in the RSIA K working area in South Jakarta. The time of research is from January until February 2022. The research population I took was all third-trimester pregnant women who were registered in RSIA K in December - January 2022 which consisted of 80 people. Teknik sampling or the sampling technique used is purposive sampling, that is, the samples involved in this study are those that meet the criteria of inclusion and exclusion that are in accordance with the purpose of the study. The study sample was 40 people with a sample number of 20 experimental groups and a control group of 20 people. Data collection was carried out in accordance with the following procedures: Preparing materials and theoretical concepts that support, Conducting Preliminary Studies, Conducting consultations with supervisors, and managing permits for data collection by requesting a letter of introduction from the Faculty of Health Sciences for the intended agency, as well as getting a reply from the agency, equations of perception with a system of researchers if needed, Data collection preceded by sample selection of respondents, collecting data from samples, processing research data by editing and coding. Exclusion criteria in this study are: Pregnant women with hypertension, diabetes mellitus, and wounds in the legs and pregnant women who have congenital defects or there are abnormalities in the legs. The instrument used in this study was an existing pitting edema scale. Thus, the validity and reliability tests were not performed. Data were analyzed by univariate and bivariate statistics. Non-parametric statistics was performed to analyze the differences in edema within the group and between groups. This study has gained permission from the ethical committee of RSIA Kemang.

RESULT

Based on table 1, it can be concluded that most of the respondents had swelling +2 (70%) before intervention and the majority had swelling +1 (85%) after intervention in the experimental group. In addition, most of the respondents had swelling +2 (60%) before the intervention and most of the respondents had swelling +1 (65%) after the intervention.

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Table 1. Distribution of Respondents based on Edema Score

Group	Edema Score	Frequency (f)	Percentage (%)
Experiment	Pretest		
	Swelling +2	14	70.0
	Swelling +3	6	30.0
	Posttest		
	Swelling +1	17	85.0
	Swelling +2	3	15.0
Control	Pretest		
	Swelling +2	12	60.0
	Swelling +3	8	40.0
	Posttest		
	Swelling +1	13	65.0
	Swelling +2	7	35.0

Based on table 2, it can be concluded that the mean edema score in the post-test was lower than the pre-test in the experiment group (mean difference=1.15) while the mean edema score in the post-test was slightly decreased than the pre-test in the control group (mean difference=0.05).

Table 2. The Foot Edema Average Before and After Intervention

Group	Mean	Mean Difference	Min	Max
Experiment				
Pre-test	2.30	1.15	2	3
Post-test	1.15		1	2
Control				
Pre-test	2.40	0.05	2	3
Post-test	2.35		1	2

From table 3, it can be concluded that there was a difference in foot edema within the experimental group before and after intervention (p=0.000, z=-3.759).

Table 3. The Differences of Foot Edema Before and After Intervention in The Experiment Group

Experiment Group	Mean Rank	Sum of Rank	Z	p
Pre	9.00	153.000	-3.759	0.000
Post	0.00	0.000		

Form the table 4, it can be concluded that there was a difference of foot edema between experiment and control group after intervention (p=0.000).

Table 4. The Difference of Foot Edema After Intervention Between Experiment and Control Group

Group	Mean	Mean Rank	p value
Experiment	1.15	11.48	0.000
Control	2.35	29.53	

DISCUSSION

Based on the results on day 1 the average leg edema in third-trimester pregnant women was at degree 3+, which means that it is deep enough, and can last more than 1 minute, extremities. The affected area appears larger and swollen. Meanwhile, on the 3rd day, the average leg edema in pregnant women was at degree 1+, which means that the pitting was light, there was no visible distortion (change), and it disappeared quickly. The average pregnant woman who experienced leg edema before the intervention was 2.30 and after being given the intervention with a foot massage and soaking warm water mixed with *kencur* for 3 consecutive days the average pregnant woman who experienced edema

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was 1.15. This means that the average degree of leg edema decreased by 1.15. Meanwhile, the control group stated that on average pregnant women who experienced edema without intervention with a foot massage and soaking warm water mixed with aromatic ginger after 3 days did not experience any symptoms.

According to Manuaba (2013) pregnant women can experience edema in their body parts, including the lower extremities to the whole body. Edema occurs due to venous pressure on fetal growth compression often occurs in the lower extremities of pregnant women. This is caused by decreased venous blood return due to the compression of the inferior vena cava by the growing fetus. This decrease in backflow results in an accumulation of fluid in the lower body, especially if pregnant women stand for a long time. In line with the results of the study by Oh & Yoon (2008) found that there was a statistically significant difference in lower extremity edema and pain in nurses after their shift and self-leg massage.

Based on research conducted by Zaenatushofi & Sulastri (2019), out of 5 respondents it was found that 2 respondents had grade 3 edema and 3 respondents had grade 2 edema. Of the 4 respondents, they were not working (housewives) and one respondent was a tailor. The rate of recovery from edema itself depends on the influence of the mother's daily activities. High maternal mobilization will be different from low maternal mobilization. High maternal mobilization is aimed at pregnant women who have activities and movements every day, such as walking, exercising, washing, and doing other household chores. The decrease in the degree of edema will be different from pregnant women who only do-little physical activity and movement every day. This difference in activity can trigger muscle tension and joint pain so it will affect the decrease in the degree of edema. In addition, based on research (Yanti et al., 2020) about characteristics based on parity in mothers in the intervention group, we can know that most respondents were in multigravida pregnancies, 5 people (50%), and a minority of respondents were in grande-multigravida pregnancies, 1 person. (10%).

According to researchers in general, leg edema that occurs in pregnant women in the third trimester is physiological leg edema, where this leg edema occurs due to suppression of the blood vessels in the right abdomen (vena cava) by the enlargement of the uterus, so that blood returning to the heart decreases and accumulates in the lower extremities. The decrease in the degree of leg edema that occurs in pregnant women can be caused physiologically, but there are other factors that cause leg edema which is based on maternal parity and depending on the mother's daily activity pattern. Therefore, pregnant women who experience leg edema in the third trimester should get immediate treatment because it will cause danger signs for pregnancy. One of the efforts to treat foot edema is by doing foot massage and soaking in warm water mixed with *kencur*.

The results showed that there was an effect of foot massage and warm water mixed with aromatic ginger foot bath on foot edema in pregnant women at RSIA Kemang Medical Care in 2022. Scientifically massage therapy has good benefits in treating edema in pregnancy. Some of the benefits of massage therapy include increasing blood circulation, relaxing muscles, relieving muscle spasms, reducing anxiety, reducing swelling and discomfort due to edema, and reducing symptoms of depression. Research on foot massage can not only reduce the degree of edema but also can provide a sense of relaxation for pregnant women during administration.

In line with Famela's research (2016) that the application of treating foot edema using foot massage and soaking warm water mixed with *kencur* is one of the non-pharmacological interventions that can be used for pregnant women. This foot massage is a therapy in the form of slowly massaging the foot area for 10 minutes a day for 5 days in a safe area that does not cause contractions. In addition to foot massage, bathing in warm water with a temperature of 38°C, you can also add aromatic ginger as aromatherapy. Aromatic ginger (*kencur*) is also often used as traditional medicine, one of which is efficacious as a compressing drug for swelling or inflammation. Warm water foot bath therapy has a physiological impact on the body. The first has an impact on the blood vessels where the warm water makes blood circulation smooth, the second is the loading factor in the water that benefits the ligamentous muscles, affect the joints of the body. Warm water has a physiological impact on the body in the form of increasing blood circulation by widening blood vessels so that more oxygen is supplied to the tissues and strengthens muscles and ligaments (Putra & Ega, 2019).

This research is supported by the results of research conducted by Yanti et al (2020). The results of the analysis in the study can be seen from the results of the pretest and posttest. Before therapy, all 10 pregnant women experienced physiological leg edema and after therapy for pregnant women, the posttest results showed that most pregnant women with edema experienced a decrease in swelling in the edematous legs, which was 10 (100%) with a p-value test. = 0.00. This means that there was an effect of foot massage and water soaking mixed with aromatic ginger on the physiological foot edema of pregnant women in the third trimester. Another study by Coban & Sirin (2010) found that foot massage results the positive effect on decreasing normal physiological lower leg oedema in late pregnancy. In addition, research was conducted in 2019 found that warm footbath with salt is recommended for reducing edema under extremity in postpartum pre-eclampsia.

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According to researchers, the effect of foot massage and warm water mixed with aromatic ginger foot bath on foot edema in pregnant women is that feet massaged for 20 minutes for 3 days in a row are very effective for improving blood circulation which is swollen due to touch or rubbing or repeated massage will causes an increase in temperature in the massage area and stimulates the nerve sensors of the feet, resulting in vasodilation of blood vessels that affects blood flow to increase, blood circulation smoothly and reduce edema. In addition, the feet that are given warm water therapy will cause heat transfer from warm water to the body, causing blood vessels to widen and muscle tension to decrease then blood circulation will be smooth. The result is blood circulation back to the heart making it easier to draw back the fluid that is in the extracellular and will be reduced. The use of aromatic ginger has long been used by Indonesian people as traditional medicine, one of which is to compress swelling or inflammation. In this case, the content of aromatic ginger contains flavonoid compounds that function as anti-inflammatory or anti-inflammatory.

CONCLUSION

Most of the respondents had swelling +2 (70%) before intervention and the majority had swelling +1 (85%) after intervention in the experimental group. In addition, most of the respondents had swelling +2 (60%) before the intervention and most of the respondents had swelling +1 (65%) after the intervention. In conclusion, there is an effect of foot massage and warm water mixed with aromatic ginger foot bath on leg edema among trimester III pregnant women at RSIA K in 2022 (p= .000). The foot massage and warm water mixed with aromatic ginger foot bath are effective to reduce leg edema among pregnant women. The healthcare provider especially the midwife needs to apply this kind of intervention to decrease leg edema in pregnant women. Future research is needed to determine other complementary therapy to solve the case of leg edema in pregnancy. A variety of edema scales was recommended for future research.

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REFERENCES

Astuti, M. (2011). *Buku Pintar Kehamilan*. Jakarta: EGC.

Bamigboye, A. A., & Smyth, R. M. (2007). Interventions for varicose veins and leg oedema in pregnancy. *Cochrane Database of Systematic Reviews,* (1).

Çoban, A., & Şirin, A. (2010). Effect of foot massage to decrease physiological lower leg oedema in late pregnancy: A randomized controlled trial in Turkey. *International Journal of Nursing Practice, 16*(5), 454-460.

Davison, J. M. (1997). Edema in pregnancy. Kidney International Supplement, (59).

Clayton, A. M., Shao, Q., Paauw, N. D., Giambrone, A. B., Granger, J. P., & Warrington, J. P. (2018). Postpartum increases in cerebral edema and inflammation in response to placental ischemia during pregnancy. *Brain, Behavior, and Immunity, 70*, 376-389.

Famela, D. (2016). Pijat Kaki Untuk Menggatasi Edema Fisiologis Iu Hamil Trimester III Ny S Umur 28 Tahun G2P1A0 Di BPM Hj. Maunah Temk]bakagung Klirong Kebumen. *Karya Tulis Ilmiah*. Stikes Muhammadiyah Gombong.

Manuaba, I. A. C. (2013). *Ilmu Kebidanan, Penyakit Kandungan, dan KB untuk Pendidikan Bidan* (2nd ed.). Jakarta: EGC.

Mitchell, M. (2014). Women's use of complementary and alternative medicine in pregnancy: A search for holistic wellbeing. *Women and Birth, 27*(4), 276-280.

Muntean, M. L., Trenkwalder, C., & Bartl, M. (2021). Restless legs syndrome during pregnancy: an overview. *Somnologie,* 1-6.

Novelia, S., & Anisah, S. (2021). The Effect of Warm Compress on Low Back Pain during Pregnancy. *Nursing and Health Sciences Journal (NHSJ), 1*(3), 254-257.

Oh, J., & Yoon, C. M. (2008). Lower extremity edema and pain of nurses and the effect of self leg massage. *Journal of Korean Academy of Nursing, 38*(2), 278-286.

Putra, Y., & Ega, S. S. (2019). Pengaruh Terapi Rendam Air Hangat Terhadap Edema Tungkai Bawah Ibu Hamil. *Jurnal Kesehatan.*

Richards, K. C., Gibson, R., & Overton-McCoy, A. L. (2000). Effects of massage in acute and critical care. *Database of Abstracts of Reviews of Effects (DARE): Quality-assessed Reviews* [Internet].

Wang, M. Y., Tsai, P. S., Lee, P. H., Chang, W. Y., & Yang, C. M. (2008). The efficacy of reflexology: systematic review. *Journal of advanced nursing, 62*(5), 512-520.

Watanabe, Y., Koshiyama, M., & Yanagisawa, N. (2017). Treatment of leg and foot edema in women. *Women's Health—Open Journal, 3*(2), 69-74.

World Health Organization. (2015). *Trends in maternal mortality: 1990-2015: estimates from WHO, UNICEF, UNFPA, World Bank Group and the United Nations Population Division*. World Health Organization.

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e-ISSN: 2798-5067
p-ISSN: 2798-5059

Yanti, M. D., Purba, T. J., Ariescha, P. A. Y., Manalu, A. B., & & Siagian, N. A. (2020). Pengaruh Penerapan Pijat Dan Rendam Kaki Dengan Air Hangat Campuran Kencur Terhadap Edema Kaki Pada Ibu Hamil. *Jurnal Kebidanan Kestra (JKK), 2*(2), 164-171.

Zaenatushofi, Z., & Sulastri, E. (2019). Penerapan Pijat Kaki dan Rendam Air Hang Campuran Kencur untuk Mengurangi Oedema Kaki pada Ibu Hamil Trimester III di PMB Supriyatin, Amd. Keb. *Proceeding of The URECOL*, 663

Zainiyah, Z., Susanti, E., & Asrifah, A. (2019). The Effect of Warm Footbath with Salt of Edema Under Extremity in Postpartum Pre Eclamsia. *Journal of Midwifery, 4*(1), 78-84.