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Effect of foot massage on postpartum blues and fatigue level among pregnant women

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Abstract--Background: Those with a diagnosis of postpartum blues are more likely to experience postpartum psychosis or depression. Foot massage appears effective, affordable, low-risk, adaptable, and simple. Aim: To evaluate the effect of foot massage on postpartum blues and fatigue levels among pregnant women. Subjects and Methods: Design: This study was carried out using a quasi-experimental design. Setting: The study was conducted in the Antenatal Outpatient Clinic at Beni-Seuf University Hospital, Egypt. Subject: A purposive sampling technique was employed to choose a sample of 100 pregnant women who were then randomly assigned into two groups, with 50 pregnant women in each group (the intervention and control groups). Tools: Two tools were used (I) a structured interview questionnaire and (II) a fatigue assessment scale. Results: The current study revealed that there were highly statistically significant differences regarding the scores of fatigue in the intervention group as compared to the control group ($P = <0.05$). a statistically significant difference between the groups was reported about postpartum blues levels after foot massage intervention. Conclusion: Foot massage was useful in reducing postpartum blues

and fatigue levels among pregnant women. Recommendations: Pregnant women should be provided with a simple and applicable strategy to reduce postpartum blues and fatigue levels during the postpartum period.

Keywords---Foot massage, Fatigue level, Pregnant women, and Postpartum blues.

Introduction

The term "blues" after giving birth refers to a depressed mood and minor symptoms of depression that are temporary. The depression symptoms include melancholy, crying, tiredness, irritability, worry, lack of sleep, difficulty concentrating, and mood swings. Usually starting two to three days after giving delivery, these symptoms peak during the next few days and go away on their own in two weeks (Jabbari et al., 2019).

Several risk factors can lead to postpartum blues. Mood fluctuations related to the menstrual cycle or pregnancy, a history of severe depression or dysthymia, an increased lifetime count of pregnancies, or a family history of postpartum depression are some examples of these.]When present, the following variables do not increase a patient's risk of developing postpartum blues: low income, race or ethnicity, gestational status (primiparous vs. multiparous), mode of delivery (vaginal vs. cesarean), planned vs. unplanned, spontaneous vs. IVF, family history of mood disorders, or prior experience with postpartum depression (Salme et al., 2018).

Postpartum blues are incredibly frequent, affecting at least 50% of women during the first few weeks following childbirth, according to estimates. Women who experience postpartum blues are roughly 4–11 times more likely to experience postpartum severe depression (Jabbari et al., 2019).

Symptoms of postpartum blues include crying, changes in appetite, irritability, anxiety, sleeplessness, and dysphoric affect (Shobeiri et al., 2018). These symptoms, when they manifest, shouldn't fit the bill for either postpartum depression or major depressive disorder, when they happen during the postpartum phase. The symptoms often appear two to three days after delivery and go away in two weeks to fully satisfy the criteria for a postpartum blues diagnosis. The postpartum depression diagnosis criteria are met if the symptoms last longer than two weeks (Ghaffari & Ghaznein, 2020).

Even in cases when symptoms of postpartum blues are moderate, fleeting, and self-limiting, patients should be closely monitored for signs of paranoia, suicidal thoughts, or thoughts of killing the baby. Additionally, to assist the patient in getting enough sleep, home support should be enlisted. Cognitive therapy and medication may be suggested if sleeplessness doesn't go away. Generally mild, fleeting, and self-limited mood swings are associated with postpartum blues. A diagnosis of postpartum blues, however, may put a person at risk for developing postpartum anxiety disorders or depression. Those who experienced mood or

anxiety symptoms throughout pregnancy have a considerably higher chance of getting postpartum depression in addition to the "baby blues (Erkek et al., 2018).

Although major depressive disorder and postpartum depression share many characteristics and are diagnosed using the same criteria, Co-morbid anxiety is often more prevalent in postpartum depressed women. The most prevalent and well-known side effect of the postpartum "blues" is postpartum depression. Furthermore, compared to women with severe depressive illness who do not have peripartum onset, these women are more likely to develop bipolar disorder (Botting, 2018).

Complementary therapies include massage, transcutaneous electrical nerve stimulation (TENS), cold and heat therapies, hypnosis, and relaxation methods. Among these, massage treatment has a lengthy history in various civilizations worldwide. Different forms of massage treatment are being used by people for a range of health-related purposes. A massage is an organic method of light touch that benefits the entire body. By affecting the nervous system, the cardiovascular system, the locomotor system, and the body's overall relaxation, it can reduce pain perception and fatigue (Massage - Physiopedia, 2021).

Among these, massage treatment has a lengthy history in various civilizations worldwide. Different forms of massage treatment are being used by people for a range of health-related purposes. Massage is a natural form of gentle touch that benefits the entire body. By affecting the nervous system, the cardiovascular system, the locomotor system, and the body's overall relaxation, it can reduce pain perception and fatigue (Salvo, 2020).

Obstetricians and other primary care professionals need to be skilled in diagnosing and treating postpartum blues and be aware of its signs. In addition to educating patients, obstetric nurses should be on the lookout for any indications of the illness. To avoid drug-drug interactions, a pharmacist should be consulted if the patient needs antidepressant therapy. The pharmacist will confirm agent selection, adequate dose, and medication reconciliation. Any problems should be reported to the prescriber/treating clinician by both the pharmacist and the nursing staff. By using these interprofessional techniques, patient outcomes will be maximized (Oleson, 2019).

Significance of the study

Postpartum psychosis or depression is more likely to occur in people with a diagnosis of postpartum blues. A study conducted in Africa revealed that women who were diagnosed with "postpartum blues" on the fifth day after giving birth had a twelve-fold higher chance of receiving a postpartum depression diagnosis one month later, and a ten-fold higher chance of receiving a postpartum depression diagnosis two months later (International Institute of Reflexology, 2022).

Massage is a methodical, rhythmic type of touch used to enhance patients' comfort and well-being. It entails a variety of soft tissue manipulations. Endorphins, which reduce pain, are produced as a result of stimulation of the

nerve fibers in the feet. With approximately 7,000 nerve endings in each extremity, the feet contain the highest concentration of pain receptors, hence foot massages and neuron stimulation may be useful methods for reducing weariness (Boyd et al., 2016).

One of the cheapest and most efficient methods of tiredness relief is a foot massage. A foot massage helps relieve postpartum depression and weariness in the arches and soles of the feet. Foot massage offers the best potential for reducing fatigue when compared to all other nonpharmacological methods. It is a simple, affordable, low-risk, and efficient massage technique for reducing fatigue and postpartum blues (Degirmen et al., 2020).

Aim of the study

To evaluate the effect of foot massage on postpartum blues **and** fatigue **levels** among pregnant women

Research hypothesis:

H1: Pregnant women who applied foot massage are expected to have a reduction in mean scores of postpartum blues level than those who do not.

H2: Pregnant women who apply foot massage are expected to have a lower fatigue level than those who do not.

Subjects and Methods

Research design:

A quasi-experimental pretest-posttest control group research design was utilized to conduct this study. It is used for establishing the cause-and-effect relationship between an independent and dependent variable.

Setting:

The study was conducted in the Antenatal Outpatient Clinic at Beni-Suef University Hospital, Egypt. It is located on the first floor. This setting was chosen because of the high attendance rate of pregnant women attending for follow-up in the previously selected setting, as well as the fact that it serves the largest population in the country. This clinic includes one room divided into diagnostic and examination areas. As well as, a waiting area for women's admission where the researchers interviewed the recruited pregnant women to implement the instructional guidelines. It started from 9 am to 12 pm.

Sample:

The participants were chosen using a purposive random sampling technique. 50 pregnant women were randomly allocated to each of two groups (the intervention and control groups) after a sample of 100 pregnant women was selected using a purposive selection technique. Asking every woman to select a piece of paper allowed for randomization. The woman who chooses to pick up the paper-carrying

letter (I) is the intervention group; the group carrying the letter (C) is the control. In the previously chosen settings, the control group received normal treatment; the intervention group, on the other hand, received a foot massage in addition to it. Based on the following criteria, the pregnant women who were part of this study were chosen:

Inclusion criteria:

- Pregnant women their age older than 18 to 65 years.
- Pregnant women free from chronic diseases
- Pregnant women In the third trimester of pregnancy
- Pregnant women had healthy feet
- Pregnant women agree to take part in the research

The exclusion criteria were as follows:

- Pregnant women are suffering from pregnancy complications.
- Pregnant women had Foot problems
- Pregnant women with Injury in extremities

Sample size calculation:

Based on the degree of significance of power analysis of 0.95($\beta=1-0.95=0.5$) at alpha, the sample size was determined. A one-sided significance of 0.05 with a big effect size of 0.5 was employed, whereas a high significance of 0.001 was applied.

Tools of data collection:

Tools: Three tools were used (I) a structured interview questionnaire and (II) a fatigue assessment scale

Tool (I): A structured interview questionnaire was developed by the researchers after reviewing the related literature and research studies (Doornbos et al., 2018; Degner, 2017); it consists of 6 items divided into two parts.

Part I: Used to collect data regarding pregnant women's demographic data, it consisted of (age, educational level, occupation, and residence) (4 items).

Part II: Used to collect data regarding obstetric history, it consisted of (gestational age, and No. of pregnancies). (2 items).

Tool (II): Fatigue assessment scale:

This instrument, a self-developed rating scale with ten items, was taken from De Kleijn et al. (2011). It measures an individual's level of fatigue during different activities throughout the week in terms of the physical, social, psychological, and spiritual domains as well as how those domains relate to the time of day. With a total score ranging from 0 to 100, the scores varied from 0 (no fatigue) to 10 (worst fatigue). Fatigue levels are as follows: zero, very little (1–9), mild (10–30), moderate (31–60), severe (61–80), and worst (81–100).

Tools validity and reliability

Three maternity nursing professionals evaluated the instruments' content validity as well as their comprehensiveness, significance, appropriateness, and intelligibility. According to the panel's assessments of the content's appropriateness and sentence clarity, no changes were made. By giving identical

instruments to the same individuals in comparable circumstances two or more times, the test-retest reliability was ascertained. The Cronbach's alpha coefficient approach was used to compare test scores from multiple administrations. With a Cronbach's alpha of 0.81 for the overall score, the fatigue assessment scale's dependability is regarded as good.

Pilot study

To assess the feasibility of the research method and notice clarity, a pilot study including ten pregnant women, or 10% of the sample, was conducted. There were no changes made. The study comprised pregnant participants from the pilot project.

Ethical considerations:

Before starting the research, ethical approval was obtained from the scientific research ethics committees of the faculties of nursing, at Beni-Suef University. The researchers met both medical and nursing directors of the selected settings to clarify the purpose of the study and get their approval. Written consent was obtained from the pregnant women to participate in the study after the objective of the study was explained to them. The researchers informed the pregnant women that, the study was voluntary, they were allowed not to participate and they had the right to withdraw from the study at any time, without giving any reason. Moreover, they were assured that their information would be confidential.

Fieldwork:

Two days a week, from 9 am to 1 pm, the researchers have visited the previously chosen sites. They introduced themselves to pregnant women and met them one-on-one before explaining the purpose of the study. Between July 1st and October 31st, 2021, a period of four months, was used to gather data. Every interview took between fifty and sixty minutes to complete. In-person interviews were employed by the researchers.

The fieldwork was completed by following these steps:

- At first, the researcher had short discussions with the pregnant women and established a cordial rapport. The structured interview questionnaire and the tiredness evaluation scale are filled out by the researchers. The following steps were taken to achieve the intervention after the researchers showed the pregnant women how to massage their feet and followed up with them a month after giving birth.
- All individuals had their levels of weariness assessed twice throughout the postpartum period by the researchers: once on the first day following delivery and again one month later. The intervention group received the massage intervention, while the control group was sent to the hospital for standard care.
- Massage is the most often used form of massage therapy. It is also referred to as light or relaxation massage. By increasing circulation and easing muscle tension and exhaustion, massage therapy enhances general health and well-being by making the body feel more at ease and energized. Friction,

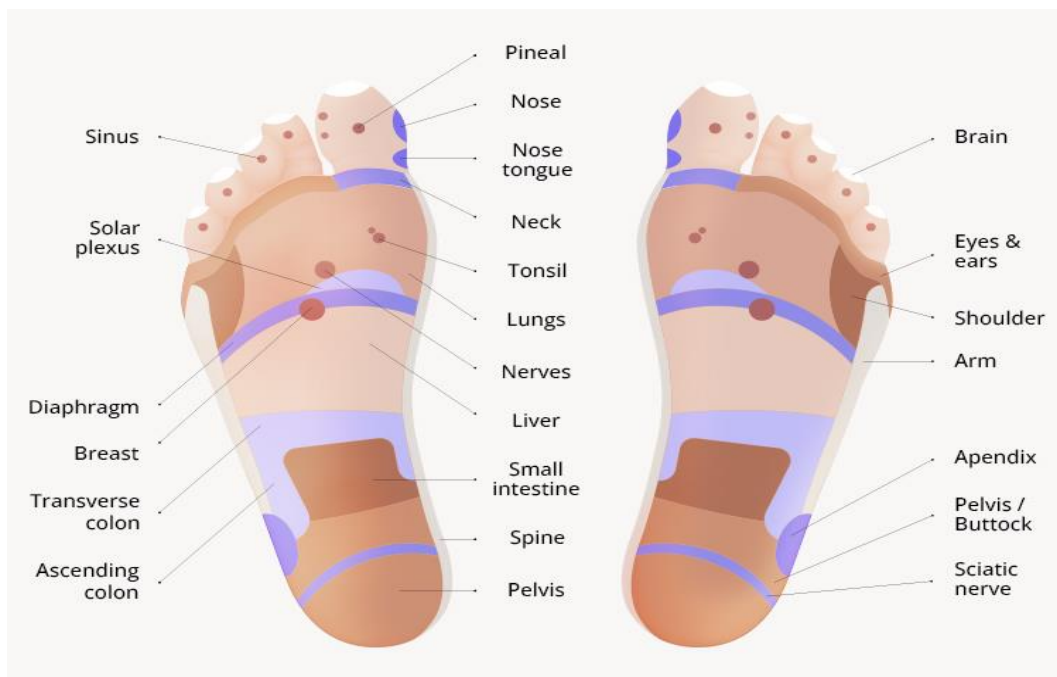
tapotement, petrissage, and effleurage are some of the massage techniques. Effleurage is a technique for evenly dispersing lubricant into the skin while also affecting the surface tissues. Before beginning additional treatments, the aim is to warm the surface layer of the tissue and create relaxation. After effleurage, there comes a kneading process called petrissage. Tapotement, sometimes known as beating percussion, is a rhythmic sequence of quick taps made with the edge of the hand, fingers, or cupped palms. Deep, circular motions that attempt to brush against something are called friction to enhance blood flow (Stone, 2010 and Salvo, 2015)

- After placing the pregnant women in a comfortable position, the extremities of the ladies received five minutes of massage therapy (5 minutes for each). The primary techniques used in specialized massage included rotational friction movements, stretching, grasping, and flexing on several foot areas without concentrating on a single place. To enhance blood flow, friction is defined as deep, circular movements that try to rub tissue layers against one another.

The following massage techniques were used:

- Using effleurage, participants' feet were stroked from toes to ankles to evenly distribute the lubricant (olive oil).
- Apply petrissage, a quick, gentle, and rolling motion, to your fingers, toes, and feet.
- Tapping with short fingers was used for tapotement (i.e. pounding or percussion).
- The layers of tissues were rubbed with friction to encourage blood flow.

The fatigue assessment scale was assessed only twice: at baseline at the first time (pre-massage) and post-test at the second time (post-massage). The intervention group received 10 minutes of foot massage per day. Pregnant women in the control group received routine hospital care only.



Administrative design

Administrative permission was obtained through an issued letter from Beni-Suef University Directors of the previously selected department to achieve this study.

Statistical analysis

The data were analyzed using SPSS statistical software version 20. Continuous data were obtained before and after the massage for three days and expressed as mean standard deviation (SD). Categorical data were expressed using numbers and percentages. The independent t-test was used to investigate differences between the two groups, while the paired t-test was employed to investigate differences between each group before and after a massage session. Changes in fatigue levels were analyzed using a one-way repeated-measures analysis of variance (ANOVA). The Mann-Whitney test was used for variables that did not match the parametric assumptions. The chi-square test was used to evaluate the results. The link between the two variables was investigated using the chi-square test. The chi-square test was used to assess the relationship between two variables in the case of noncontiguous data. A P value of less than 0.05 was used to determine statistical significance.

Results

Table 1 displays that the samples' mean age was 24.22 ± 9.33 years for the intervention group and 23.21 ± 8.35 years for the control group, respectively. In terms of education, it was found that whereas 58% of the pregnant women in the control group had a secondary education, just 50% of the women in the

intervention group had the same degree. The same table showed that 62% of pregnant women in the intervention group were housewives, compared to 64% in the control group. Pregnant women in the intervention group were more likely to live in cities (70%) than in the control group (65%). The demographic information of the two groups did not significantly differ from one another.

Table 2 demonstrates that there was no statistically significant difference in the obstetrical history between the two groups. The majority of the women who were studied (68% and 72%) had one or fewer pregnancies, with 1 or fewer in the intervention and control groups, respectively. It was found that the intervention group and the control group had mean gestational weeks of 36.1 ± 0.5 and 37.1 ± 1.4 , respectively.

Table 3 shows that, when compared to the control group, the intervention group's fatigue scores significantly decreased, indicating a highly significant change in the level of exhaustion among pregnant women.

Table 4 indicates that there was a significant statistical difference in the mean score of pregnant women in the intervention group before and after the intervention, with a p-value of less than 0.05.

The study's pregnant women in the intervention group showed a highly significant reduction in their Postpartum Blues level both before and after the intervention, as seen in Figure 1. Before the intervention, 30% of pregnant women had severe postpartum blues; however, after the intervention, nobody experienced severe postpartum blues.

Table 5 demonstrates that, in terms of postpartum blues level, there was a statistically significant difference and a notable drop between the mean pre and post-test scores of pregnant women in the intervention group at the 0.001 level.

Table (1): Pregnant women's demographic data distribution (n=100)

Demographic data	The intervention group (n=50)		Control group (n=50)		X ²	p-value
	No.	%	No.	%		
Pregnant women's age						
18 < 30	29	58.0	28	56.0	4	0.15 ^{NS}
30 ≤ 40	21	42.0	22	44.0		
Mean ±Stander deviation	24.22 ± 9.33		23.21 ± 8.35			
Pregnant women's education						
-Primary education	13	26	10	20.0	3	0.16 ^{NS}
-Secondary education	25	50	29	58.0		
-University education	12	24	11	22.0		
Pregnant women's Occupation:						
-Working	19	38	18	36	3	4.22 ^{NS}
-Housewives	31	62	32	64		
Pregnant women's residence:						
-Urban	35	70	30	60	2	1.35 ^{NS}

Demographic data	The intervention group (n=50)		Control group (n=50)		X2	p-value
	No.	%	No.	%		
-Rural	15	30	20	40		

NS=non-significant

Table (2): Pregnant women's obstetric history distribution (n=100)

Obstetric history	Intervention group (n=50)		Control group (n=50)		X2	p-value
	No.	%	No.	%		
No. of pregnancies						
1 < 3	16	32.0	14	28.0	1.33	0.12 NS
> 3	34	68.0	36	72.0		
Gestational week						
Mean ±Stander deviation	36.1±0.5		37.1± 1.4		1.27	0.14 NS

Table (3): Total fatigue level during post-test among pregnant women in both control and intervention groups (n=100)

Fatigue level	Intervention group (n=50)		Control group (n=50)		T	P-value
	No	%	No	%		
No fatigue (0)	5	10	0	0.0	17.44	<0.001**
Very little (1-9)	14	28	0	0.0		
Mild (10-30)	16	32	0	0.0		
Moderate (3- 60)	15	30	22	42		
Severe (61-80)	0	0.0	15	32		
Worst (81-100)	0	0.0	13	26		

Table (4): Comparison between fatigue mean scores pre and post-intervention among studied groups (n=100)

Group	Fatigue level				X2	p-value
	Pretest		Posttest			
	Mean Score	SD	Mean Score	SD		
Intervention Group	2.66	1.06	3.55	1.09	57.3	<0.001**
Control Group	2.49	1.01	2.79	0.61	0.56	1.63 ^{NS}

NS=Non-significant, *= significant at p<0.05 level

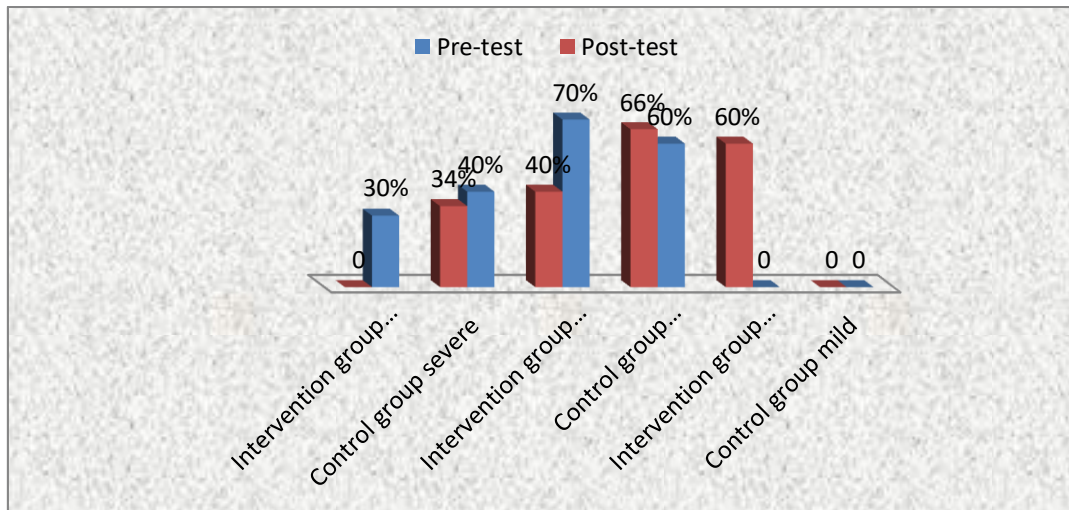


Figure 1: The Level of Postpartum Blues of the pregnant women in both intervention and Control Group (n=100)

Table 5 Comparison between mean post-test scores among pregnant women who had postpartum blues in the intervention group and control group (n=100)

Group	Mean	SD	Mean difference	t test	p value
Intervention group	25.33	10.49	37.77	13.66	0.001*
Control group	64.23	9.76			

NS=Non-significant, *= significant at $p < 0.05$ level

Discussion

During and after pregnancy, foot massage was found to be a beneficial adjunct therapy in lowering pain and exhaustion. Massage therapy's exact mode of action is unknown, but it appears to control neurotransmitters in the central nervous system, which helps to reduce fatigue and treat anxiety disorders (Abbaspoor et al., 2019). As a result, the current research study aimed to evaluate the effect of foot massage on postpartum blues **and** fatigue **levels** among pregnant women

According to the current study's findings, there was no significant difference in the two groups' obstetrical and demographic histories. The baseline levels of weariness and postpartum blues were comparable in the two groups, according to the researchers.

The results of this study showed that, when compared to the control group, the intervention group's fatigue scores significantly decreased, indicating a highly significant improvement in the level of exhaustion among pregnant women. According to the researchers, this outcome illustrates the beneficial effects of

applying foot massages, which satisfy the demands of expectant mothers and lessen their degree of exhaustion.

According to the study's findings, pregnant women's fatigue level scores showed a significant difference, decline, and improvement. The researchers surmise that this outcome can be explained by the production of certain peptides during massage, which have analgesic and sedative properties and reduce the activity of the sympathetic nervous system, which is engaged during stressful events like surgery (Kotani et al., 2021). It demonstrated, in the researchers' opinion, the observable benefits of foot massage in enhancing and lessening weariness. It has been confirmed that the pregnant women's degree of weariness significantly changed, reflecting the primary objectives of the massage intervention.

Between before and after the intervention, Wang et al., (2019) found a substantial change in general fatigue and foot fatigue. The effects of reflexology on stress, exhaustion, and blood circulation in middle-aged premenopausal women were demonstrated by Jin & Kim (2017) their findings demonstrated that reflexology alone was beneficial in lowering middle-aged premenopausal women's reported levels of stress and exhaustion and improving blood circulation. According to Zhang et al., (2021) findings, there was a significant difference in the three trimesters of pregnancy between the groups of employed and housewife women's levels of exhaustion, with employed women experiencing higher levels of weariness. Jang & Kim (2019) investigated fatigue in early-pregnant women in exploratory research. Their results showed that a large part of the sample (90%) experienced fatigue and it had a significant effect on their ability to maintain their individual and social activities. Three studies showed the potential healing benefits of reflexology on fatigue (Shobeiri et al., 2017),

The study's findings demonstrated a statistically significant difference between the intervention and control groups' mean pretest and posttest scores for pregnant women concerning their level of fatigue. According to the experts, this indicates that pregnant women's fatigue can be effectively reduced by applying foot massages. This result is corroborated by Babu & Annal's (2019) research, which found that there was a significant difference in the fatigue levels of the intervention and control groups between the pre-and post-test.

The study's findings demonstrated that the mean pretest and posttest scores of the pregnant women in the intervention and control groups differed statistically significantly in their level of fatigue. According to the experts, this indicates that pregnant women's weariness can be effectively reduced by applying foot massages. This result is corroborated by Babu & Annal's (2019) research, which found that there was a significant difference in the fatigue levels of the intervention and control groups between the pre-and post-test.

The effects of education on reducing fatigue were similar in the experimental and control groups, according to the results (Huang et al., 2021). According to Hosseini Nasab et al., (2020), who conducted a study on the effect of pregnancy-related training on women's fatigue, these trainings may reduce fatigue to the point that the trained women felt less fatigued than the control group. Del Aram M and Soltanpour F's findings showed that counseling pregnant women in their

third trimester decreased their feelings of weariness and anxiety. To lessen the weariness experienced by nulliparous women in their late pregnancy, counseling is advised (Yaqi et al., 2020).

The results of the study showed that the pregnant women in the intervention group had a highly significant improvement in their Postpartum Blues level both before and after the intervention. Additionally, the mean pretest and posttest scores of pregnant women in the intervention group showed a statistically significant change and a substantial decrease in the postpartum blues level. According to the researchers, this finding shows the beneficial effects of applying foot massage, which is appropriate for pregnant women and helps to enhance fatigue levels and lessen postpartum blues.

Four research investigations (Nasiri et al., (2019), Navaee et al., (2019), Sehhatti et al., (2020), and Semra et al., (2020) demonstrated reflexology's effectiveness in reducing anxiety. The meta-analysis also supported the previously mentioned findings, particularly on reflexology's immediate effectiveness in lowering labor fatigue and its ongoing effectiveness in shortening labor duration and easing anxiety.

Conclusion

It was determined based on the study's results and hypothesis that Foot massage as a non-pharmacological nursing intervention was useful in reducing postpartum blues and fatigue levels among pregnant women.

Recommendations

The following suggestions are put forth in light of the findings of the current study:

- Pregnant women should be given a practical, easy-to-implement method to help them feel less exhausted and blue after giving birth.
- Enhancing the knowledge of expectant mothers on foot massage and its beneficial impact on mitigating postpartum depression and exhaustion.
- Additional research on the impact of various massage techniques on postpartum depression and exhaustion in expectant mothers to reduce the negative physical and psychological effects.
- Future research and replication of this work with a larger sample size to allow for generalization.

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