

Effect of Perineal Massage on Perineal Traumas for Nulliparous Women during Labor

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Abstract

Background: Short and long-term morbidity in women is associated with perineal trauma, mainly caused by subsequent vaginal delivery. Interventions that increase the likelihood of intact perineum are therefore needed. **Purpose:** This study aimed to evaluate the effect of perineal massage on perineal traumas for nulliparous women during labor. **Methods:** This Comparative quasi-experimental design was conducted in the labor unit at Suez Canal University Hospital. A purposive sample of 74 laboring women in the labor unit. Three tools were used for data collection, interviewing questionnaire for assessing demographic characteristics. Observational checklist and visual Analogue Scale (RAS). **Results:** The incidence of perineal trauma was significantly lower for women who received perineal massage during labor than those who did not (54.05% in the massage group had intact perineum compared to 29.73% in the control group). The perineal pain score among women in the massage group is also lower than in the control group at the end of labor and the fourth stage of labor. **Conclusions:** This study concluded that perineum massage performed in the active phase of labor is safe, increases the occurrence of an intact perineum, decreased the risk of episiotomy and severe perineal trauma. As well as perineal pain, which improves the quality of life in women post vaginal delivery. **Implications for Practice:** Awareness program for healthy nulliparous women regarding the benefits of perineal massage by their health care providers.

Keywords: Labor, Nulliparous, Perineal massage, Perineal trauma, Intact perineum.

Introduction

Childbirth is a physiological process that is the most important period in women's lives and affects different aspects of their lives. Perineal trauma during childbirth is a very common event. Perineal trauma refers to any damage to the genital tract that occurs spontaneously as a laceration or an episiotomy, especially during the first vaginal birth (Ugwu, Ifeirikigwe, Obi, Eleje, & Ozumba, 2018).

In obstetric practice, an episiotomy is defined as one of the procedures performed routinely and inadequately (Desplanches et al., 2019). Several studies have reported the side effects of episiotomy, insufficient prevention of obstetric anal sphincter injuries (OASIS), and even an increased risk of OASIS. Thus, the current guidelines recommend limiting the use of episiotomy, and numerous studies have reported a significant decrease in episiotomy rates (Räisänen 2014).

Maternal and fetal characteristics and procedures may facilitate the presence of perineal trauma during labor. Maternal age,

parity, gestational age, fundal pressure, and nationality are associated with perineal trauma. Besides, labor procedures such as the induction of oxytocin, the use of forceps, and episiotomy increase the risk of perineal trauma (Abedzadeh-Kalahroudi, Talebian, Sadat, & Mesdaghinia, 2019).

Injury to the perineum leads to a variety of secondary morbidities during the postpartum period. Most of these lacerations may not contribute to unfavorable functional effects. More generally, severe perineal lacerations are associated with an elevated risk of injury to the pelvic floor, fecal and urinary incontinence, discomfort, and sexual dysfunction with symptoms that may linger or occur several years after birth (Akhlaghi, Baygi, Miri, & Najafi, 2019). The most common report from women following a perineal injury is pain. Other consequences of a perineal injury are bleeding, stitching, long postpartum recovery, delayed contact between mother and infant. These symptoms are worse in women who underwent episiotomy than those who had tears (Aasheim, Nilsen, Reinar, & Lukasse, 2017).

Perineal tissues should be pulled aside to allow the newborn to leave the vagina. Perineal pulling and massaging studies have shown that perineal pulling and massaging increase the possibility of childbirth with intact perineum in the second stage of labor (Shahoei, Zaheri, Nasab, & Ranaei, 2017).

Also, some studies have shown less postpartum perineal pain following perineal massage during pregnancy or the second stage of childbirth. Perineal massage enhances perineal results by stretching out the tissues of the vagina, facilitating perineal relaxation, and enhancing tissue circulation. The net result of all these interventions is that the baby can 'let her baby out' more quickly, reducing the risk of damage to her perineum and vagina (Dieb et al., 2019).

Significance of the study

Short and long-term morbidity in women is associated with perineal trauma, mainly caused by post vaginal delivery. Therefore, in 85% of vaginal births, perineal injury occurs (Shahoei et al., 2017).

Perineal massage enhances perineal results by stretching the tissues of the vagina, facilitating perineal relaxation, and increasing tissue circulation. This study was conducted to determine the effect of perineal massage on perineal lacerations, episiotomy, and perineal pain in nulliparous women going to childbirth during the end of the first stage of labor. A nurse usually did the perineal massage during the first stage of labor. No studies on this topic may be conducted in Suez Canal University, so this study aimed to evaluate the effect of perineal massage on alleviating perineal lacerations, episiotomy, and perineal pain in nulliparous women during the first stage of labor at Suez Canal University Hospital in Ismailia.

Aim of the Study:

This study aimed to evaluate the effect of perineal massage on perineal traumas for nulliparous women during labor.

Specific Objectives:

- Identify the common perineal problems among nulliparous women during the

second labor stage in Suez Canal University Hospital.

- Investigate the effects of perineal massage on reduce the incidence of perineal lacerations, episiotomy during labor second stage.
- Explore the effect of o perineal massage on reducing perineal pain during the end of the first stage and postpartum period for nulliparous women.

Research hypothesis:

Using digital perineal massage will reduce the incidence of perineal lacerations, episiotomy, and perineal pain in nulliparous women compared with the control group.

Methods:

Study design:

Comparative quasi-experimental design.

Setting:

The study was conducted at Suez Canal University Hospital. The obstetrics department includes four sections (emergency obstetric, inpatient ward, obstetric outpatient clinics, and obstetric operating room). The obstetric emergency department consists of 3 rooms and an ultrasound room. This setting is selected because there is a high flow rate of nulliparous women during labor who come from different surrounding cities and villages.

Study Sample:

Target population:

Nulliparous women come to the study setting for normal delivery.

Sampling technique:

A purposive sample was recruited in this study according to eligibility criteria. The 74 women were randomly allocated into two equal age-matched groups, the massage, and the control group.

Inclusion criteria: Nulliparous women and Gestational age of 38–42 weeks; cephalic presentation and Cervical dilatation 4–10 cm

Exclusion criteria: Women with a history of preeclampsia, heart disease, diabetes mellitus,

failure to labor progress, and fetal distress; Women with abnormal bleeding during pregnancy; Women performing Kegel exercises during pregnancy; Administration of narcotics or oxytocin; and Edema of the perineum and erythematous rashes.

Sample size:

To assess application of perineal massage during labor versus control group, repeated measures analysis of variance is proposed (ANOVA). A minimum total sample size of 74 samples (minimum of 37 per group) will be sufficient to detect the effect size of 0.23 according to Cohen (1988)1, a power (1-β=0.95) of 95% at a significance probability level of p<0.05 partial eta squared of 0.05. A total sample size of 74 will be applied and, accordingly, each group will be represented by 37 samples. The sample size was calculated according to G*Power software version 3.1.9.2 (1-5)

Where;

f: is the effect size; α= 0.05; β=0.05; Power=1- β = 0.95

$$f = \frac{\sigma_{\mu}}{\sigma}$$

$$\sigma_{\mu}^2 = \frac{\sum_{i=1}^k h_j (\mu_i - \mu)^2}{N}$$

Tools of data collection:

Three tools were used in this study:

Tool (I): A structured interview:

The interview questions developed by the researchers are based on an extensive literature review. It used to collect the information from the women, and it consists of 2 parts:

Part (1) included socio-demographic data like age, education level, residence, and occupation.

Part (2): Obstetrical history contained the number of pregnancies, number of abortions, and the use of family planning method(s).

Tool (II): Observational checklist

Developed by the researchers based on an extensive literature review. It was used to

collect the following information: labor progress assessment through cervical dilatation and uterine contraction which assessed by frequency, duration and interval, episiotomy, degrees of perineal laceration, neonate's birth weight, head circumference, and 1 minute Apgar score).

Tool (III): visual Analogue Scale (RAS):

The rating analog scale was created by French rheumatologists (**Portenoy & Tanner, 1996**). A simple assessment tool start of 0 on one end which representing no pain to a 10 cm line with on the other end, a categorical scale are none, mild, moderate and severe pain indicated by a patient.

Procedure:

1-Preparatory phase:

The researchers reviewed local and international related literature about the various aspects of the research problem. This helps the researcher be acquainted with the magnitude and seriousness of the problems and guides the researcher to prepare the required data collection tools. The study tools were prepared and tested for their validity. The collected data started on 7 April 2019 until the end of September 2019(26 september).

Tool validity:

Tools tested for its validity by a jury consisting of five experts in obstetrics and gynecological nursing and medicine.

Pilot study:

A pilot study was carried out on eight women (10% of the study sample) to test the tools' validity and applicability. Then necessary modifications were done according to the pilot study results. Those women were excluded from the study sample.

Reliability of tool:

The reliability of was assessed by piloting and measuring the related Cronbach's alpha value (Alpha=0.88).

2- Interviewing phase:

At the Suez Canal University hospital's emergency obstetrical department, the researchers were receipted the selected women

to assess socio-demographic and obstetrical history by interviewing them during the first stage of labor.

3- Interventional phase:

Each woman in the study (massage) group has received the treatment involved a perineal massage. They were receiving 30-minute massage treatment during the first stage of labor when cervical dilatation becomes 4 cm. At the same time, the woman in the control group received routine care in the hospital.

The technique of massage:

- The researchers wore sterile gloves and used a sterile lubricant to lubricate their index and middle fingers.
- The massage started with effleurage strokes uses both hands' gliding to massage an area of skin, one hand in front of the other.
- With a gentle pressure up and down towards the rectum, the researchers performed a massage on the perineum so that each portion (U-shaped reciprocating motion).
- The message lasted one minute between 3 and 9 O'clock.

4- Evaluation and follow up phase:

The researchers assessed the type of episiotomy (if performed) and the presence and degree of perineal laceration for the interventional group (massage group) post-intervention and the control group during the third stage of labor. Perineal pain was followed up during the end of the first stage of labor, the fourth stage, and after 2, 4 days of postpartum.

Administrative design:

Before the research's conduction, official letters were obtained from the Faculty of Nursing dean, directed to the directors of Suez Canal University to official permission to conduct the study.

Ethical considerations:

The study was accepted by the Research Ethical Committee of the Faculty of Nursing Suez Canal university on date 31/3/2019 code 52/2(2019). The researchers informed women about the nature, process, and expected

outcomes of the study reassured them that the research was safe, assured them that information was obtained confidential and used only for the study, and informed them about her rights to withdraw at any time throughout the research. Written approval was obtained from the study sample.

Statistical analysis:

The collected data was arranged and analyzed using the Statistical Package of Social Science (SPSS) program, and suitable statistical tests were used.

Data were collected and entered into the computer using SPSS (Statistical Package for Social Science) program for statistical analysis (ver 21) (IBM Corp., Released 2012). Kolmogorov-Smirnov test of normality revealed significance in the distribution of the variables, so the nonparametric statistics was adopted. (Field, 2013) Comparisons were carried out between two studied independent groups using the Mann-Whitney U test (Mann & Whitney, 1947). Chi-square test was used to test the association between qualitative variables (Pearson, 1900).

Results:

The median age in the massage group (n=37) was 24.00 (22.00-28.00), while for the control group (n=37), it was 23.00 (21.00-28.00), there was no statistically significant difference in the age (years) between the two groups ($p=.632$).

The perineum was intact in 20 (54.05%) women in the massage group, compared with 11 (29.73%) in the control group. There was a statistically significant difference between the two groups ($p=.034$). 17 (45.95%) women had an episiotomy in the massage group, compared with 25 (67.57%) in the control group. There was no statistically significant difference ($p=.060$). The perineal laceration was statistically significantly higher in the control group 19 (51.4%) compared to 9 (24.3%) women in the massage group ($p=.017$) (Figure 1).

5/9 (55.56%) had a first-degree perineal laceration in the massage group, 4/9 (44.4%) had a second degree. While in the control group, 3/19 (15.79%) had a first-degree perineal laceration, 4/19 (21.05%) had a second degree, 8/19 (42.11%) had a third-degree,

while 4/19 (21.05%) had a fourth degree. There was a statistically significant difference in the distribution of degrees of perineal laceration between the two studied groups ($p=0.021$). Control group women had perineal lacerations in higher degrees (3 or 4) than the massage women group (Figure 2).

Regarding grades of **uterine strength** (mild, moderate, or severe), there was no statistically significant difference in the distribution between the two studied groups at the first hour ($p=.626$). After 2 hours, 21 (56.76%) women had moderate strength in the massage group, which is statistically significantly higher than the controls ($p=.000$). After 4 and 6 hours, there was no statistically significant difference ($p=.116$; $.144$; respectively). Regarding **the duration of contractions** at the first hour, there was no statistically significant difference between the two groups ($p=.160$). After 2, 4, and 6 hours, the contraction duration was statistically

significantly longer in the massage group ($p=.001$, $p=.000$, and $p=0.000$, respectively). There was no statistically significant difference in **the frequency of uterine contractions** between the two groups at first and after 2 hours ($p=.558$; $p=.137$, respectively). After 4 and 6 hours, the frequency was statistically significantly higher in the massage group ($p=.000$, $p=.000$; respectively) (Table 1).

There was no statistically significant difference in birth weight (g) ($p=.167$), head circumference (cm) ($p=.746$), and 1-minute Apgar score ($p=.881$) (Table 2).

The Rating Analogue Scale (RAS) was statistically significantly higher in the control group compared with the massage group at the end of the first stage of labor ($p=0.007$), at the fourth stage of labor ($p=0.000$), after two days postpartum ($p=0.000$) and after four days postpartum ($p=0.000$) (Table 3).

Table (1): Percentage distribution of studied groups regarding demographic data

	Massage (n=37)	Control (n=37)
Age		
n	37	37
Min-Max	18.00-37.00	18.00-33.00
Mean \pm Std. Deviation	24.89 \pm 4.56	24.78 \pm 4.61
95% CI for mean	23.37-26.41	23.24-26.32
Median (IQR)	24.00 (22.00-28.00)	23.00 (21.00-28.00)
KS test of normality	D=0.147, p=0.041*	D=0.197, p=0.002*
Education		
Illiterate+ reads and writes	8	7
n	21.62%	18.92%
% within Group		
Primary+ preparatory+ secondary	17	25
n	45.95%	67.58%
% within Group		
Institute+ university	12	4
n	32.43%	10.81%
% within Group		
postgraduate	0	1
n	0.00%	2.70%
% within Group		
Occupation		
unskilled manual working	13	3
n	35.14%	8.11%
% within Group		
farmer	1	0
n	2.70%	0.00%
% within Group		
housewife	23	34
n	62.16%	91.89%
% within Group		
Residence		
urban	19	2
n	51.35%	5.41%
% within Group		
rural	18	35
n	48.65%	94.59%
% within Group		

n : Number of patients
IQR: Inter-quartile range

Min-Max: Minimum – Maximum
MW: Mann-Whitney U test

CI: Confidence interval

Table (2): Characteristics of uterine contraction at the first stage among the studied groups

	Massage group (n=37)	Control group (n=37)	Test of significance <i>p</i> -value
Strength			
First hour			
- Mild	25 (67.57%)	23 (62.16)	$\chi^2_{(df=1)} = 0.237$ <i>p</i> =.626 NS
- Moderate	12 (32.43%)	14 (37.84)	
After 2 hours			
- Mild	16 (43.24%)	33 (89.19)	$\chi^2_{(df=1)} = 17.458$ <i>p</i> =.000*
- Moderate	21 (56.76%)	4 (10.81)	
After 4 hours			
- Mild	0 (0.00%)	2 (5.41%)	$\chi^2_{(df=2)} = 5.014$ <i>p</i> _(MC) =.116 NS
- Moderate	34 (91.89%)	35 (94.59%)	
- Severe	3 (8.11%)	0 (0.00%)	
After 6 hours			
- Moderate	10 (27.03%)	16 (43.24%)	$\chi^2_{(df=1)} = 2.135$ <i>p</i> =.144 NS
- Severe	27 (72.97%)	21 (56.76%)	
Duration			
First hour			
- Min-Max	40.00-50.00	30.00-40.00	$Z_{(MW)}=1.405$ <i>p</i> =0.160 NS
- Median (IQR)	40.00 (40.00-40.00)	40.00 (40.00-40.00)	
After 2 hours			
- Min-Max	30.00-60.00	30.00-40.00	$Z_{(MW)}=3.214$ <i>p</i> =.001*
- Median (IQR)	40.00 (40.00-50.00)	40.00 (40.00-40.00)	
After 4 hours			
- Min-Max	10.00-50.00	40.00-50.00	$Z_{(MW)}=6.418$ <i>p</i> =0.000*
- Median (IQR)	50.00 (50.00-50.00)	40.00 (40.00-40.00)	
After 6 hours			
- Min-Max	40.00-70.00	40.00-70.00	$Z_{(MW)}=4.687$ <i>p</i> =.000*
- Median (IQR)	60.00 (60.00-60.00)	40.00 (40.00-60.00)	
Frequency			
First hour			
- Min-Max	1.00-3.00	All reading = 2	$Z_{(MW)}=0.585$ <i>p</i> =.558 NS
- Median (IQR)	2.00 (2.00-2.00)		
After 2 hours			
- Min-Max	2.00-3.00	2.00-3.00	$Z_{(MW)}=1.487$ <i>p</i> =0.137 NS
- Median (IQR)	2.00 (2.00-2.00)	2.00 (2.00-2.00)	
After 4 hours			
- Min-Max	2.00-4.00	2.00-3.00	$Z_{(MW)}=4.521$ <i>p</i> =.000*
- Median (IQR)	3.00 (2.00-3.00)	2.00 (2.00-2.00)	
After 6 hours			
- Min-Max	2.00-5.00	2.00-3.00	$Z_{(MW)}=5.787$ <i>p</i> =.000*
- Median (IQR)	3.00 (3.00-3.00)	2.00 (2.00-3.00)	

Min-Max: Minimum – Maximum

IQR: Inter-quartile range

MW: Mann-Whitney U test

 χ^2 = Pearson Chi-square test

df= degree of freedom

MC: Monte Carlo correction for a p-value of Pearson Chi-square test

* : Statistically significant (*p*<0.05)NS: Statistically not significant (*p*≥0.05)

Table (3): Birth weight, head circumference, and 1-minute Apgar score after the intervention in the two studied groups

	Massage group (n=37)	Control group (n=37)	Test of significance <i>p</i> -value
Birth weight (g)			
Min-Max	2000.00-4000.00	2500.00-4500.00	$Z_{(MW)}=1.380$
Median (IQR)	3000.00 (2500.00-3500.00)	3000.00 (2750.00-3500.00)	$p=.167$ NS
Head circumference (cm)			
Min-Max	34.00-35.00	34.00-35.00	$Z_{(MW)}=0.325$
Median (IQR)	35.00 (35.00-35.00)	35.00 (35.00-35.00)	$p=.746$ NS
1-minute Apgar score			
Min-Max	6.00-10.00	6.00-10.00	$Z_{(MW)}=0.150$
Median (IQR)	8.00 (7.00-10.00)	8.00 (7.00-9.00)	$p=0.881$ NS

Min-Max: Minimum – Maximum

IQR: Inter-quartile range

MW: Mann-Whitney U test

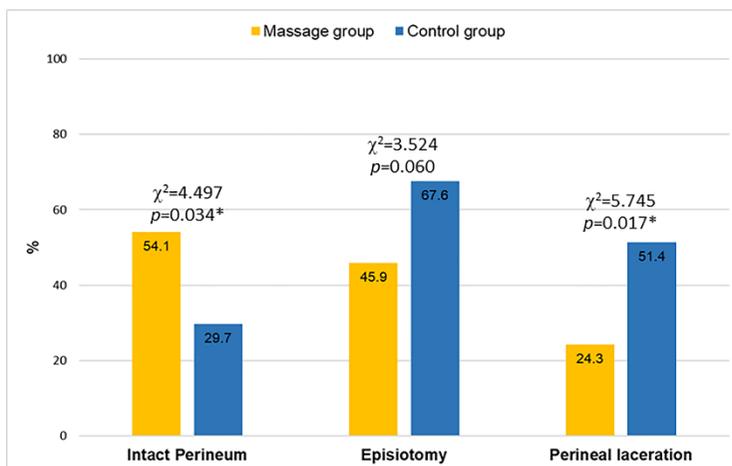
* : Statistically significant ($p<0.05$)NS: Statistically not significant ($p\geq 0.05$)**Table (4):** Rating Analogue Scale (RAS) in the two studied groups

	Massage group (n=37)	Control group (n=37)	Test of significance <i>p</i> -value
RAS score (end of the first stage of labour)			
- Min-Max	7.00-10.00	6.00-10.00	$Z_{(MW)}= 2.681$
- Median (IQR)	8.00 (7.00-9.00)	9.00 (8.00-9.00)	$p=0.007^*$
RAS score (fourth stage of labour)			
- Min-Max	2.00-4.00	4.00-9.00	$Z_{(MW)}= 7.257$
- Median (IQR)	3.00 (3.00-4.00)	7.00(6.00-8.00)	$p=0.000^*$
RAS score (after two days postpartum)			
- Min-Max	1.00-4.00	3.00-9.00	$Z_{(MW)}= 7.235$
- Median (IQR)	2.00 (2.00-3.00)	7.00 (5.00-7.00)	$p=0.000^*$
RAS score (after four days postpartum)			
- Min-Max	1.00-4.00	2.00-7.00	$Z_{(MW)}= 6.588$
- Median (IQR)	2.00 (2.00-2.00)	4.00 (3.00-6.00)	$p=0.000^*$

Min-Max: Minimum – Maximum

IQR: Inter-quartile range

MW: Mann-Whitney U test

* : Statistically significant ($p<0.05$)NS: Statistically not significant ($p\geq 0.05$)**Figure (1):** Distribution of intact perineum, episiotomy, and perineal lacerations in the two studied groups

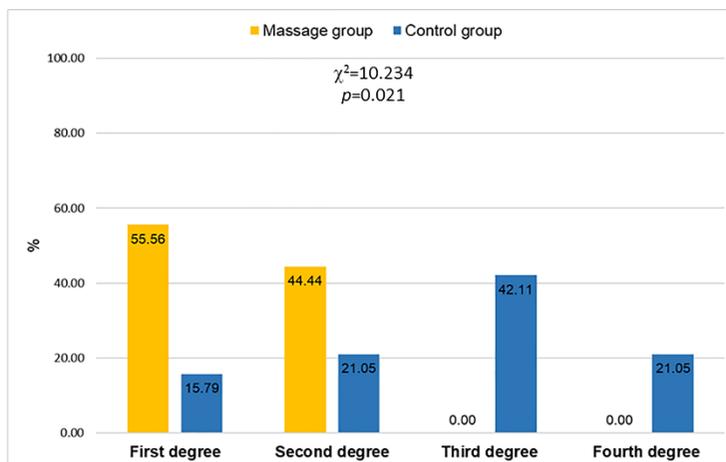


Figure (2): Distribution of perineal lacerations according to their degree in the two studied groups

Discussion

This study has indicated that perineal massage during vaginal delivery may reduce the risk of perineal trauma. In the present study, the frequency of perineal lacerations was substantially lower in majority of women who received perineal massage during labor compared with those who did not.

In the same respect, research conducted by **Vieira et al. (2018)**, which examined scientific evidence of perineal integrity management and preservation during the expulsive stage of labor, concluded that perineal massage with lubricants performed at the end of pregnancy by women or their partners was recommended as a measure beneficial to perineal safety. Furthermore, **Shahoei et al. (2017)** and recorded that perineal massage can minimize the need for an episiotomy and prevent perineal injury and perineal pain during the second stage of labor. These will indicate that perineal massage reduces the incidence of perineal trauma performed during pregnancy or the active phase of labor. Also **SEEHUSEN & RALEIGH, (2014)**, reported in that women who performed perineal massage showed a reduction in perineal trauma requiring suturing.

Although, **Shimoda, Soares, Aragaki, and McArthur (2015)** recommended perineal massage frequency 3-4 times per week in the prenatal period. **SEEHUSEN & RALEIGH, (2014)**, showed that only those who performed

massage up to 1.5 times per week on average had a statistically significant reduction in the incidence of episiotomy, whereas the women who used massage more frequently did not have a statistically significant reduction. The results of this analysis determined that daily massage reduced the risk of episiotomy by 17%, first-degree tears by 16%, second-degree tears by 0%, and third- and fourth-degree tears by 22% (**Goh, 2018**).

While there are no studied the effect of perineal massage on the duration and frequency of uterine contraction, the results of current study revealed that uterine contractions are more frequent in the massage group than in the control group. The duration of uterine contraction is longer in the massage group than the control group, with a statistically significant difference. This may indicate that stretching the perineum may improve the characteristic of uterine contraction, which in turn affects the length of labor.

Perineal trauma harms a woman's life as it has been associated with perineal pain, urinary, sexual dysfunction, and fecal incontinence (**Friedman, Ananth, Prendergast, D'Alton, & Wright, 2015**). The study demonstrated that the score of perineal pain is less among massage group women than in the control group at the end of the first and fourth-stage labor in the second and fourth days postpartum. This is in line with the prospective observational research by Eogan et al. (2006), who found that postnatal perineal

pain decreased in women who performed antenatal perineal massage. In the same line. Jamshidi Manesh and Hosseini (2012) investigated the effectiveness of massage on pain during the second labor stage. They found that massage is an effective method for increasing the intact perineum and decreasing perineal pain.

On the other hand, a randomized control study conducted by Stamp, Kruzins, and Crowther (2001) found that perineum massage and stretching were performed during the second stage of labor by hospital midwives. (full dilatation of the cervix or ≥ 8 cm if nulliparous or ≥ 5 cm if multiparous) with a water-soluble lubricant, does not increase the likelihood of intact perineum or decrease the risk of pain, dyspareunia, or urinary and fecal problems. Moreover, the study conducted by Karaçam, Ekmen & Çalışır, (2012) showed the same results. Therefore, based on these finding perineal massage are more effective if done in the antenatal period or during the first stage of labor.

A recent anthropological model concluded that due to biological intergenerational selection and iatrogenic factors such as the higher behavior of C-sections worldwide, higher perineal trauma rates seen in the future contribute to an increase in fetal body weight and fetal head (Mitteroecker, Windhager, & Pavlicev, 2017).

Conclusion:

Perineal massage performed in the active phase in labor are safe; the occurrence of intact perineum increases, and the risk of episiotomy and severe perineal trauma is decreased. As well as perineal pain, which improves the quality of life in women post vaginal delivery.

Recommendations:

A training program for nurses regarding perineal massage in the first stage of labor. Also, Awareness' program for healthy nulliparous women regarding the benefits of perineal massage by their health care providers.

Further research is needed to determine whether perineal massage reduces urinary incontinence after birth.

Limitation:

The research was limited by the low number of women involved, timing and duration of

implementation, and procedure variations used in second-stage management (i.e., Ritgens Maneuver).

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