

Effect of Warm Compresses Versus Lubricated Massage During the Second Stage of Labor on Perineal Integrity Among Primiparous Women

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Abstract: Background: Worldwide, the majority of women experience different degrees of perineal tears during childbirth. Thus, the prevention of perineal tears becomes an urgent need. **The Purpose of this study:** was to compare the effect of warm compresses versus lubricated massage during the second stage of labor on perineal integrity among primiparous women. **Design:** A quasi experimental comparative research design was utilized. **Setting:** The present study was conducted in the obstetrics and gynecology department, at Menoufia University Hospital. **Sample:** A convenient sample of 150 primiparous women was selected from labor unit in obstetric department at Menoufia university hospital and divided into three groups (two study groups and one control group). **Two instruments** were used for data collection; **Instrument I:** A structured interviewing questionnaire. **Instrument II:** Assessment and observational birth outcome sheet. **Results:** The results of the present study revealed that perineal tears had significantly reduced among women who used lubricated massage (4%) and warm compresses (12%) compared to the control group (26%). **Conclusion and Recommendations:** The use of warm compresses and lubricated massage had effectively reduced the degree of perineal tears, the degree of episiotomy extension, and the duration of the second stage of labor compared to the control group.

Keywords: Warm compresses, Lubricated massage, Perineal Integrity.

Introduction

Labor is a series of events that take place for the fetal head to expel the viable products of conception (fetus, placenta, umbilical cord, and membranes) out of the uterus through the vagina. Generally, the labor process is divided into four stages; first, second, third, and fourth stage (Murray, 2019). The second stage of

labor is considered to be the peak of the birthing process; it refers to the period that elapses between the onset of fully cervical dilatation, effacement, and delivery of the fetus. This stage is the most dangerous one that needs appropriate evidence-based nursing practice to prevent perineal tears (Manderville & Little, 2019).

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The perineal tear is an extremely common and expected complications of vaginal birth that result from any perineal injury during childbirth. It may happen as a spontaneous tear due to pressure of the fetal presenting part on the perineum during vaginal delivery. Worldwide, more than 53-89% of women during childbirth experience different degrees of perineal tear, especially among primipara women. A study conducted in Egypt about different degrees of perineal tear among primipara women showed that 43% of the studied sample had perineal tears (Dutta, 2019 & Jansson et al., 2020).

Perineal tears can be classified according to their severity into four degrees; the first-degree occurs spontaneously in the perineal skin, the second degree includes the perineal muscles and skin, while the third-degree includes the anal sphincter complex and the fourth-degree includes anal sphincter complex and anal epithelium. Moreover, previous studies have shown that perineal tear is accompanied by various short and long-term complications including; rupture of the anal sphincter, urinary and fecal incontinence, recto-vaginal fistula, perineal pain, dyspareunia, and bleeding (Meutter et al., 2018 & Naidu et al., 2018).

Prevention is much better than treatment. Most of the trials that had been done to prevent perineal tear concluded that there is a positive correlation between perineal muscle elasticity, perineal blood supply, perineal lubrication during the second stage, and decreased rate of perineal tear (Harris, 2020).

Maternity nurses can use different non-pharmacological approaches and strategies to prevent perineal tears in the second stage of labor (Zare et al., 2014 & Williams et al., 2021).

These strategies include perineal muscle exercises, perineal lubrication, and massage, hands-on (perineal supports) and hands-off techniques, cold and warm applications during the second stage of labor. Each one of these strategies may be used alone or in combination with others. Recent researches studies reported that perineal massage during the second stage of labor is very effective in relaxing the perineum, preventing laceration through increased elasticity, the blood supply to the perineum, and the release of internal endorphin (WHO, 2018 & Aquino et al., 2020).

Moreover, perineal warm compresses can also be used to reduce perineal tear and improve maternal comfort during the second stage of labor which leads to vasodilatation; increasing tissues blood supply; assisting tissue stretching as well as facilitating the removal of tissues waste products. In addition, the warm sensation is known to make dermal stimulation that decreases pain perception, induces relaxation, and reduces nerve tension (Magoga et al., 2019).

Benefits of the previous two techniques include reducing and preventing perineal tears all over the world. There is little attention regarding the effectiveness and application of these techniques during the second stage of labor, in Egypt (Petrocnik & Marsha, 2019 & Yap et al., 2019). This study was conducted to compare the effect of warm compresses versus lubricated massage during the second stage of labor on perineal integrity among primiparous women.

Significance of the study:

Perineal tears are a serious health problem that leads to serious long-term complications that negatively affect the women's physical, psychological and social health. The use of lubricated

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massage or warm compresses to prevent or decrease the incidence and degree of perineal tear is still controversial. A study conducted in England concluded that the prevalence of perineal tear among primiparous women was 91.4% (Smith, et al., 2017). A study conducted in Zagazig, reported that 27% of the subjects had spontaneous perineal tears (second degree and more) and 16% had intentional tears (episiotomy). So, the total incidence among the study sample was 43% (Mohamed, 2017). Few studies examined the comparative effects between warm compresses and lubricated massage.

Therefore, this study was conducted to compare the effect of warm compresses versus lubricated massage during the second stage of labor on perineal integrity among primiparous women.

Purpose of the Study

The purpose of the present study was to:

Compare the effect of warm compresses versus lubricated massage during the second stage of labor on perineal integrity among primiparous women.

Research Hypotheses

- **H1:** Primiparous women who receive warm compresses will experience lower adverse perineal integrity during the 2nd stage of labor than those who receive routine hospital care & lubricated massage.
- **H2:** Primiparous women who receive lubricated massage will experience lower adverse perineal integrity during the 2nd stage of labor than those who receive routine hospital care & warm compresses.
- **H3:** Primiparous women who receive routine hospital care will experience lower adverse perineal integrity during the 2nd stage of

labor than those who receive warm compresses & lubricated massage.

Methods

Research Design:

A quasi experimental (comparative) research design was utilized in this study.

Research Setting:

The present study was conducted in the Obstetrics and Gynecology department, at Menoufia University Hospital. This setting was selected because it had a high flow rate of women for delivery. The obstetrics and gynecology department is composed of 6 wards and about 36 beds, 3 operation rooms, observational room, neonatal care room, 2-bathroom, nurses' office, educational room, and sonar room.

Sample selection:

A convenient sample of 150 primiparous women undergoing vaginal delivery was recruited and assigned to three groups:

- **Group 1:** 50 primiparous women received warm compresses on the perineum during the 2nd stage of labor.
- **Group 2:** 50 primiparous women received lubricated massage on the perineum during the 2 nd stage of labor.
- **Group 3:** 50 primiparous women received routine hospital care during the 2 nd stage of labor.

Inclusion criteria:

- 1) Primiparous women.
- 2) Second stage of labor and expecting normal delivery.
- 3) Intact perineum
- 4) Single fetus and vertex presentation.

Sample Size was calculated using the following formula:

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$$n = \left(\frac{r + 1}{r} \right) \frac{(p)(1 - p)(Z_{\beta} + Z_{\alpha/2})^2}{(P_1 - P_2)^2}$$

Where:

- n = Desired number of samples
- r = Control to cases ratio (1 if same numbers of subject in both groups)
- p = Proportion of population = $(P_1 + P_2) / 2$
- Z_{β} = It is the desired power (0.84 for 80% power and 1.28 for 90% power)
- $Z_{\alpha/2}$ = Critical value and a standard value for the corresponding level of confidence.
- (At 95% CI or 5% type I error it is 1.96 and at 99% CI or 1% type I error it is 2.58)
- P_1 = Proportion in study groups
- P_2 = Proportion in control group

(Sharma, et al., 2020).

Data Collection instruments:

The data were collected throughout the course of the present study using the following instruments which were reviewed by qualified experts, then tested for validity and reliability.

Instrument I:

A structured interviewing questionnaire. It was developed by the researcher guided by Ibrahim, et al., (2017) to match the purpose of the study and the culture of the participants. It involved two main parts:

- **Part 1:** Demographic data of the primiparous women such as; age, occupation, education, residence and anthropometric measurements {height (cm), weight (kg), body

mass index (BMI), weight (kg) / height (m²)}.

- **Part 2:** Current pregnancy profile such as; gestational age, fundal height, antenatal care, and medical disorder during pregnancy.

Validity of Instrument I:

The validity of the instrument was established by five qualified experts (three Professors in the Maternal and Newborn Health Nursing department and two Professors in the obstetrics and gynecology department, Faculty of Medicine). They reviewed the instrument for content accuracy and internal validity. Suggestions were incorporated into the instruments and modifications were made.

Reliability of Instrument I:

The reliability of the instrument was computed by the researcher for testing the internal consistency of the instrument. The researcher used test-retest reliability. It took place through the administration of the same instrument to the same participants under similar conditions on two or more occasions. Scores from repeated testing were compared to test the consistency of the results over time.

Instrument II:

Assessment and observational birth outcome sheet: it was developed by the researcher guided by, Tanos & Toney. (2019). It included three parts:

- **Part 1:** Second stage characteristics, included the progress of labor, oxytocin stimulation, and duration of the second stage (min).
- **Part 2:** Assessment of newborn birth outcomes and their characteristics such as newborn's birth weight (kg) and newborn's head circumference.
- **Part 3:** Assessment of perineal condition such as intact, episiotomy, perineal tear, and its degree. 1)

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First-degree tear: Injury includes the perineal skin and/or vaginal mucosa, 2) Second-degree tear: Injury involving perineal muscles but not involving the anal sphincter, 3) Third-degree tear: Injury involving the anal sphincter complex: Grade 3a tear: less than 50% of external anal sphincter (EAS) thickness torn. Grade 3b tear: more than 50% of EAS thickness torn. Grade 3c tear: both EAS and internal anal sphincter (IAS) torn and fourth-degree tear: injury of perineum involving the anal sphincter complex (EAS and IAS).

Validity of Instrument II:

The validity of the instrument was established by five qualified experts three experts from the Maternal and Newborn Health Nursing department and two experts from the obstetrics and gynecology department, Faculty of Medicine). They reviewed the instrument for content accuracy and internal validity. Suggestions were incorporated into the instruments and modifications were made.

Reliability of Instrument II:

The reliability of this instrument was computed by the researcher for testing the internal consistency of the instrument. The researcher used test-retest reliability. It took place through the administration of the same instrument to the same participants under similar conditions on two or more occasions. Scores from repeated testing were compared to test the consistency of the results over time.

Pilot study:

A total of 10% of the participants (15 primiparous women) were included in the pilot study in order to assess the feasibility, clarity of the instruments and determine the needed time to answer the questions. The results of the

pilot study helped in refining the interviewing questionnaire and setting the final schedule. The necessary modifications were made according to the pilot study results. So, they were excluded from the study sample to assure the stability of the results.

Ethical Considerations:

The researchers introduced themselves to the primiparous women, explained the purpose of the study and the nature of the research to obtain their acceptance to participate in the study and to gain their cooperation. Approaches to ensure the ethics were considered in the study regarding confidentiality. Confidentiality was achieved by the use of locked sheets with the names of the participating women replaced by numbers. All women were informed that the information they provided during the study would be kept confidential and used only for statistical purposes. The findings would be presented as a group of data without the participant's personal information remains. Informed consent was obtained from all primiparous women after explaining the nature and purpose of the study. Each woman was informed that participation in the study was optional and they were given the opportunity to freely refuse participation.

Administrative Approvals:

An official letter was taken from the Dean of the Faculty of Nursing, Menoufia University and submitted to the director of the study setting so as to carry out the study. An official permission was obtained to carry out the study from the director of the above mentioned setting. A full explanation of the rationale of the present study was provided to the directors of the study settings. An approval from the committee of

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hearing and ethics was obtained from the Faculty of Nursing Menoufia University.

Study Maneuver

The Preparatory Phase:

A reviewing of past and current literature covering the various aspects of the problem was done using books, articles, magazines and network about studies related to perineal trauma as well as various perineal supportive techniques used during the second stage of labor.

The Implementation Phase:

All women recruited in this study were informed that participation is voluntary and were ensured about privacy and confidentiality. After obtaining the acceptance of women to participate in the study, they were divided into three equal groups.

- **Group 1:** pregnant women receiving warm compresses technique during the second stage of labor.
- **Group 2:** pregnant women receiving perineal massage technique during the second stage of labor.
- **Group 3:** pregnant women receiving routine care of the hospital “hands on” technique and those were control group.

Data collection for this study started from beginning of July 2021 to end of December 2021. The study was conducted 3 days per week on a regular basis. At first, the researcher informed each woman alone about the study in simple terms and explained the technique that would be performed in the delivery room.

The researcher interviewed about 2 - 3 women / day in the delivery room for about (two hours in the second and third stage of labor and about two

hours in the fourth stage of labor) and the researcher did the following:

- 1) Women in group 1 which received warm compresses; a clean warm perineal compress was applied by the researcher to the women's perineum during the whole second stage of labor. The applied warm perineal compress was carried out as follow: A sterile metal container was filled with warm water then a sterile towel was soaked in the water and squeezed before being placed gently on the perineum during each uterine contraction. The temperature ranged from 38° C to 44o C during its application for about (5-10 min). The temperature was measured by water thermometer used especially for ascertaining the precise temperature of hot and cold fluids and provides reliable measurement of temperature. Between contractions, the towel was re-soaked in the water to maintain warmth then reapplied again. The water in the metal container was replaced every 15 minutes until delivery or if the temperature dropped.
- 2) Woman in the group 2 which received perineal message, the researcher wear a glove-covered hand placed the tripper sterile water solution (KY gel) on the middle finger and index finger, started a slow massaging of the vagina in U-shaped motion with gentle pressure toward the rectum from one wall to another wall so that each part lasted about one second. The massaging was done during and between pushes. The downward pressure was determined by the woman's response and if the woman felt pain or burning, the pressure of researcher's fingers would be reduced. The total length of

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massage therapy was about 5 to 10 min.

- 3) When crowning was done in woman receiving routine hospital care known as hands on technique, the nurse placed the index, ring and little fingers of her left hand close together on the fetus's occiput with the palm turned toward the anterior region of the perineum. Simultaneously, the right hand was flattened and placed on the posterior perineum with the index finger and the thumb forming a "U" shape, exerting pressure on the posterior region of the perineum during the crowning process.
- 4) Immediately after delivery, the researcher performed visual inspection and examination of the genital tract and noted the site and severity of any trauma and whether suturing was performed at any site.
- 5) Data collection after birth included the allocated technique, what was actually done and for how long, and whether the mother asked the researcher to stop or change technique. These items were recorded on the post-delivery data sheet.
- 6) A questionnaire was distributed by the researcher to determine the socio demographic characteristics of the participants and complications after birth.

Statistical Analysis

Data was coded and transformed into a specially designed form to be suitable for the computer entry process.

Quantitative data were presented by mean (X) and standard deviation (SD). It was analyzed using the student t-test for comparison between two means, and ANOVA (F) test for comparison between more than two means.

Qualitative data were presented in the form of frequency distribution tables, numbers, and percentages. It was

analyzed by the chi-square (χ^2) test. However, if an expected value of any cell in the table was less than 5, Fisher Exact test was used (if the table was 4 cells) or the Likelihood Ratio (LR) test (if the table was more than 4 cells). The level of significance was set as a P value <0.05 for all significant tests.

Results

The present study was carried out to compare the effect of warm compresses versus lubricated massage during the second stage of labor on perineal integrity among primiparous women.

The results of this study were classified under (8) tables and 7 figures. The results are covered under 5 main parts:

- **Part I:** Socio-demographic characteristics regarding the studied primiparous women: (table, 1).
- **Part II:** Antenatal history and minor discomfort about current pregnancy regarding the studied primiparous women: (tables, 2 - 4).
- **Part III:** Second stage characteristics, as well as newborn characteristics regarding the studied primiparous women (tables, 5- 6).
- **Part IV:** Perineal integrity after delivery regarding the studied primiparous women (table, 7) and (figures 1).
- **Part V:** Relationship between variables of the three studied groups (Table, 8) & (Figure 2).

Table (1) highlights the socio-demographic characters of the studied primiparous women. The majority of primiparous women among the three groups were aged ranged from 25 to 30 years (84%, 52%, and 100% respectively). Also, the majority of primiparous women in lubricated massage and warm compresses groups had university education (48% & 68%

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respectively) compared to 28% in the routine hospital care group.

The table also reveals the anthropometric measurements of current pregnancy, with the highest mean weight and BMI in lubricated massage group (than the other two groups (84.9 ± 6.6 Kg and 33.2 ± 3.3 respectively).

Table 2 presents the antenatal history about current pregnancy. There was a statistical significant difference ($P < 0.0001$) between the three studied groups regarding each item in the antenatal history. Regarding the place which provide the antenatal care, the difference was highly statistically significant ($P < 0.0001$). The difference was statistically significant ($P < 0.0001$) regarding the mean fundal height.

Table 3 reveals that the minor discomforts during current pregnancy in the three studied groups. There was statistically significant difference ($p < 0.0001$) between studied sample (three groups) regarding minor discomforts during present pregnancy.

Table 4 demonstrates the investigations done during current pregnancy, there were significant difference between the studied three groups regarding performing the investigations ($P < 0.0001$).

Table 5 reveals the second stage characteristics of labor, since the majority of the studied participants showed spontaneous labor. There was statistically significant difference ($p < 0.0001$) among the three studied groups regarding progress of labor.

Regarding the onset of labor the difference was statistically significant ($P < 0.0001$). A similar trend was observed concerning “membrane”, and this difference was statistically significant ($P < 0.002$). Concerning duration of second stage of labor the difference was statistically significant ($P < 0.04$).

Table 6 demonstrates the newborn characteristics in the studied groups and the difference was statistically significant ($P < 0.002$). In addition, regarding the mean fetal head circumference the difference was not statistically significant ($P = 0.09$).

Table 7 Highlights the perineal integrity after delivery in the studied three groups. There was highly statistically significant difference ($P < 0.0001$) between the three groups regarding perineal condition. In addition, regarding the degree of perineal tear, the difference was statistically significant ($P < 0.01$).

Table 8 Reveals the relationship between fetal head circumference and perineal condition in the studied three groups. Primiparous women in lubricated massage group who had intact perineum, had fetuses with mean fetal head circumference of 33.80 ± 0.78 cm, the difference was highly statistically significant ($P = 0.01$). In addition, Primiparous women in lubricated massage group who had tear requiring repair, had fetuses with mean fetal head circumference of 34.2 ± 0.63 , the difference was statistically significant ($P = 0.01$).

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Table 1: Socio-demographic Characteristics regarding Studied Primiparous Women (N=150)

Variables	Lubricated massage (=50)		Warm Compresses (=50)		Routine Hospital care (=50)		χ^2
	N0	%	N0	%	N0	%	
Age:							
20 – 24 years	8	16	24	48	0	0	15.5
25 - 30 years	42	84	26	52	50	100	
Education:							
Illiterate	21	42	10	20	24	48	LR=41.1
Read and Write	0	0	0	0	7	14	
Secondary education	5	10	6	12	5	10	
University	24	48	34	68	14	28	
Employment status:							
Work	10	20	7	14	7	14	0.89
Not work	40	80	43	86	43	86	
Residence:							
Urban	20	40	30	60	26	52	1.4
Rural	30	60	20	40	24	48	
Anthropometric measurements							
Height (cm) X ± SD	161.1±5.4 cm		163.5±4.1 cm		163.3±5.8		F=3.2
Weight (Kg) X ± SD	84.9±6.6 Kg		81.5± 5.8 Kg		81.1± 6.3		F=5.7
BMI X ± SD	33.2±3.3		31.1±3.3		30.9±2.3		F=8.10

χ^2 :Chi-Square **LR**: Likelihood Ratio **F**: One –way ANOVA

Table 2: Antenatal History about Current Pregnancy regarding the Studied Primiparous Women (N=150)

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Variables	Lubricated massage (=50)		Warm Compresses (=50)		Routine Hospital care (=50)		LR	P-value
	N0	%	N0	%	N0	%		
	Mean fundal height: Mean± SD	38.4±0.81		38.7±0.71		39.3±1.5		
Antenatal care:								
Yes	45	90	50	100	50	100	LR=11.3	<0.006
No	5	10	0	0	0	0		
If yes (N0 =145) where?								
Hospital	0	0	8	16	8	16	LR=14.9	<0.03
M.C.H	24	48	28	56	28	56		
Private doctor	21	42	14	28	14	28		
Starting antenatal care at which month of pregnancy?) (n=45 for 1st gr.)								
First & second month	40	88.9	32	64	40	80	LR=79.2	<0.0001
Third & fourth month	5	11.1	18	36	10	20		
Reason for initial visit:								
To monitor pregnancy & Perform investigations	45	100	50	100	50	100	-----	-----
N0. of the visit to antenatal care:								
1 – 5 times	0	0	14	28	8	16	LR=123.3	<0.0001
6 – 10 times	45	100	36	72	42	84		

F: One –way ANOVA

Table 3: Minor Discomforts during Current Pregnancy regarding the Studied Primiparous Women (N=150)

Variables	Lubricated massage (=50)		Warm Compresses (=50)		Routine Hospital care (=50)		LR	P-value
	N0	%	N0	%	N0	%		
	Minor discomforts during pregnancy :(n=45 for the first group)							
Constipation	37	82.2	50	100	37	74	LR=14.9	<0.0001
Hemorrhoids	5	11.1	0	0	6	12		
Varicose veins	0	0	0	0	2	4		
Urinary symptoms	3	6.7	0	0	5	10		

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Table 4: Investigations during Current Pregnancy regarding the Studied Primiparous Women (N=150)

Variables	Lubricated massage (n=50)		Warm Compresses (n=50)		Routine Hospital care (n=50)		* χ^2 /LR	P-value
	N0	%	N0	%	N0	%		
	Perform any investigation during pregnancy?							
Yes	33	66	50	100	50	100	LR=38.3	<0.0001
No	17	34	0	0	0	0		
If yes, which lab. Of the following:								
Yes (N0.=133)								
CBC	20	60.6	34	68	5	10	LR=82.5	P<0.0001
Blood group	6	18.2	4	8	0	0		
RH	4	12.1	12	24	33	66		
Proteins in urine	0	0	0	0	5	10		
Glucose in urine	3	9.1	0	0	7	14		
Subtotal	33	100	50	100	50	100		

Table 5: Second Stage Characteristics of Labor regarding the Studied Primiparous Women (N=150)

Variables	Lubricated massage (n=50)		Warm Compresses (n=50)		Routine Hospital care (n=50)		* χ^2 /LR	P-value
	N0	%	N0	%	N0	%		
	Progress of labor:							
Spontaneous labor	50	100	46	92	45	90	LR=7.7,	<0.0001
Induced labor	0	0	4	8	5	10		
Onset of labor:								
Show	33	66	27	54	19	38	$\chi^2=44.9$	<0.0001
True labor pain	17	34	19	38	7	14		
Dilatation of internal os	0	0	4	8	24	48		
Membrane								
Rupture	17	34	15	30	31	62	$\chi^2=12.5$	<0.002
Intact	33	66	35	70	19	38		
Liquor: Clear	50	100	50	100	50	100	NA	NA
Gestational age at birth:								
Pre-term	0	0	3	6	0	0	LR=18.5	<0.001
Term	50	100	42	84	50	100		
Post-term	0	0	5	10	0	0		
Duration of second stage (minutes): Mean± SD	88.3± 7.3		90.8±6.3		91.5± 6.2		F=3.1	<0.04

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Table 6: Newborn Characteristics regarding the Studied Primiparous Women (N=150)

Variables	Lubricated massage (=50)		Warm Compresses (=50)		Routine Hospital care (=50)		P-value
	N0	%	N0	%	N0	%	
	Fetal birth weight (Kg)						
Mean ± SD	3.28 ± 0.25		3.09 ± 0.35		3.04 ± 0.34		F=6.4 0.002
Fetal head circumference (cm):							F=0.09 = 0.90
Mean ± SD	33.72 ± 0.78		33.66 ± 0.79		33.63 ± 0.79		

F: One –way ANOVA

**Part IV: - Perineal Integrity after Delivery Regarding Studied Primiparous Women
(N=150)**

**Table 7: Perineal Integrity after Delivery regarding Primiparous Women
(N=150)**

Variables	Lubricated massage (=50)		Warm Compresses (=50)		Routine Hospital care (=50)		* χ^2 /LR	P-value
	N0	%	N0	%	N0	%		
	1. Perineal condition:							
• Intact perineum	43	86	30	60	5	10	LR=61.8	P<0.0001 HS
• Tear not required repair	0	0	2	4	0	0		
• Tear required repair	2	4	4	8	13	26		
• Episiotomy	5	10	8	16	32	64		
2. Perineal tear :							$\chi^2 = 14.4$	P< 0.0001 HS
• Yes	2	4	2	12	13	26		
• No	48	96	44	88	37	74		
3. If yes, degree of perineal tear (N0.=21):							$\chi^2 = 0.22$	P=0.63 NS
• First	2	4	2	4	7	14		
• Second	0	0	3	6	3	6		
• Third	0	0	1	2	3	6		
5. Degree of episiotomy extension							LR= 2.9	P=0.09 NS
• No or mild extension	4	8	5	10	15	30		
• Second degree or marked extension	1	2	3	6	17	24		

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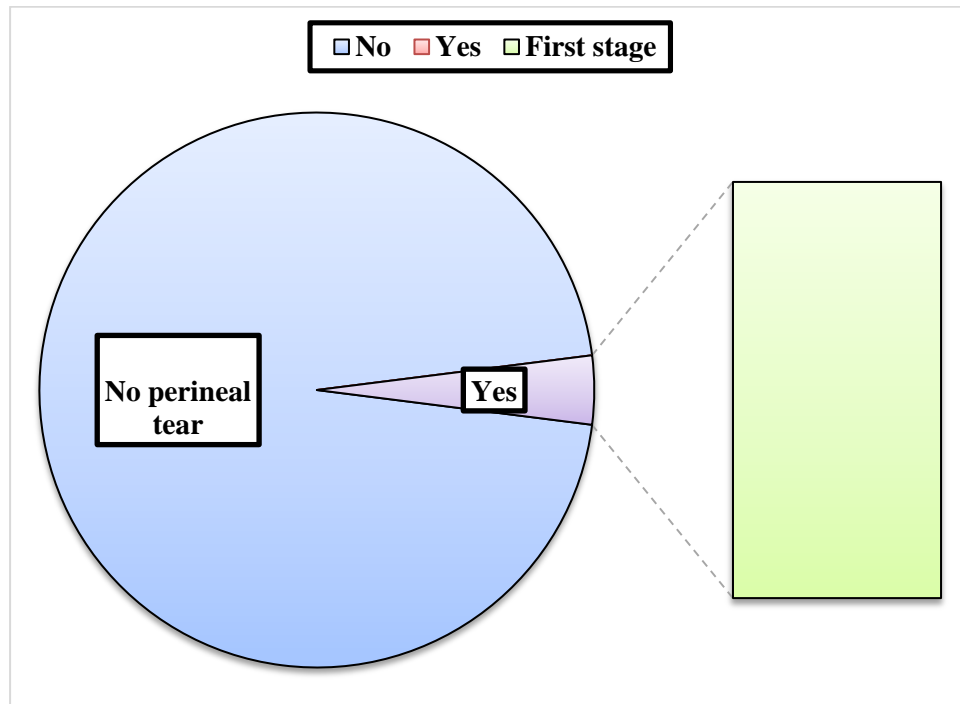


Fig. 1: Perineal Tear and its Degree in Lubricated Massage Group (N=50)

Part IV: Relationship between Variables of the Studied Groups:

Table 8: Relationship between the Three Studied Groups regarding Fetal Head Circumference and Perineal Integrity (N=150)

Variables	Lubricated massage (=50)	Warm compresses (=50)	Routine Hospital care (=50)	F TEST	P value
	Head circumference mean± SD	Head circumference mean± SD	Head circumference mean± SD		
Head circumference mean± SD					
Intact perineum	33.80± 0.78	33.6± 0.54±	33.6 ±0.72		
Tear not requiring repair	0	34.0±0.81	0	F=5.8	P<0.01
Tear requiring repair	34.2±0.63	33.7±0.79	33.8± 0.6		
Episiotomy	34.7 ± 0.66	34.5±0.51	33.7± 0.79		
F test	2.8	1.9	1.3		
P-value	0.10 NS	0.38 NS	0.57 NS		

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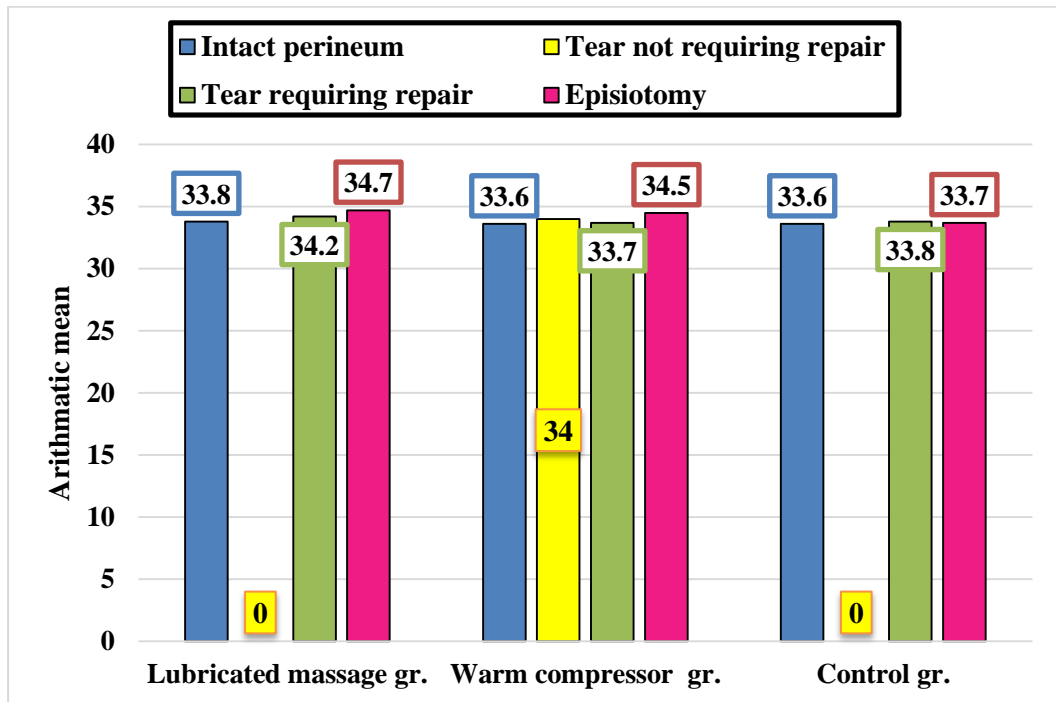


Fig. 2: The Relation between Fetal Head Circumference and Perineal Condition regarding the Three Studied Groups (N=150)

Discussion

The discussion encompasses the socio-demographic characteristics and anthropometric measurements of current pregnancy, clinical information as well as the medical history during the current pregnancy; second stage characteristics, as well as the newborn characteristics. Also, it included perineal integrity after delivery and the relation between the study variables. Regarding the sociodemographic characteristics, the findings of the present study pointed out that the studied women of the three groups are matching in nearly most of the aspects with regards to their socio-demographic characteristics. This matching is useful in limiting the extraneous variables which may interfere with the effect of utilizing perineal massage, and warm compresses techniques during the second stage of labor on perineal integrity. It means that there were no

significant differences among the study women of the three groups regarding their sociodemographic characteristics. This finding was in line with Ibrahim et al., (2017) who investigated "the effect of warm compresses versus lubricated massage during the second stage of labor on perineal outcomes among primiparous women in Egypt" and Monem et al., (2020) who studied "the effect of hands-on, hands-off and warm compresses perineal techniques during the 2nd stage of labor on perineal outcomes among primipara with vaginal delivery in Egypt". They reported that the study participants (study and control groups) were homogenous in their socio-demographic characteristics. This finding is supported by Fahami et al., (2022) who studied the effects of perineal management techniques on labor complications stated that there were no significant differences among

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the study women of the three groups regarding the age and level of education. Also, there were no significant differences among the study women of the three groups regarding the residence, occupation and family income. This finding is supported by Bulchandani et al., (2022) who studied the manual perineal support at the time of childbirth.

Meanwhile, the study findings are not consistent with, Gaheen and Abo-Hatab (2021), who investigated "the effect of utilizing perineal massage, warm compresses and hands on techniques during the second stage of labor on perineal outcome in Egypt" and Ibrahim et al., (2017). They reported that there was no statistically significant difference among the study participants (study and control groups) regarding their sociodemographic characteristics.

Regarding the anthropometric measurements, the present study demonstrates that the mean body mass index of the lubricated massage group has the highest mean weight and BMI than the warm compresses and routine hospital care groups. This may be explained that obesity decreased the risk of obstetrics anal sphincter injuries (OASI). These findings come in agreement with Andre et al., (2021), who studied the "Obstetric Anal Sphincter Injuries. Maternal, Fetal and Sociodemographic Risk Factors: A Retrospective Register-Based Study in Europe", and stated that increasing body mass index (BMI) showed a decreased risk of OASIS in the crude analysis; however it is only apparent in the adjusted model after adding birth weight to the analysis.

The study findings are also in agreement with Mansour et al., (2021), who studied "Effect of Maternal Body Mass Index on progress and outcome of labor in nulliparous pregnant mother

in Egypt", and stated that maternal obesity in all three obesity classes tends to decrease the risk for all three degrees of anal sphincter injuries after adjustment for instrumental delivery, birth weight and late fetal head position. The strongest risk factor for anal sphincter laceration was large birth weight and the risk of anal sphincter injury decreased slightly with increasing maternal BMI.

The study findings are also in agreement with Durnea et al., (2018), who studied the "Effect of body mass index on the incidence of perineal trauma". A retrospective cohort study was conducted in Riyadh, Saudi Arabia, and indicated an association between obesity and perineal tears. From the researcher's point of view was that the increased amount of adipose tissue makes the perineal tissue softer and more stretchable, and a larger perineal body increases the anovaginal distance.

These findings come in contrast with Al Ghamdi, (2018), who studied the "Incidence and Risk Factors for Development of Third and Fourth Degree Perineal Tears" in Egypt and reported that obese women had a higher perineal tear rate, mostly second-degree tearing, than those with normal BMI. Besides, there was no significant difference in the incidence of third-degree perineal tear in obese women.

These findings also come in contrast with Kamel & Ibrahim., (2018), who studied the "Maternal Obesity and its Effect in Late Pregnancy and Labor in Egypt", and revealed that the rate of only third and fourth-degree perineal tears decreased with increasing BMI, whereas the opposite was true for the first and second-degree perineal tears, which increased with increasing BMI. From the researcher's point of view the incongruence between this study and

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other studies may be due to the large study population, and the data included an ethnically heterogeneous population.

Concerning the progress of labor, the present study findings revealed that the majority of the studied women showed spontaneous labor. Therefore, there were statistically significant differences among the three studied groups regarding the progress of labor and there was an evident decrease of labor induction among the lubricated massage group during the 2nd stage of labor compared to warm compresses and control groups.

These findings are consistent with Gaheen & Abo-Hatab, (2021), and revealed that there was a significant increase in the percentage of women who had progress labor among the three study groups compared to the control group with statistically significant difference.

These findings are consistent with a study conducted by Monem et al., (2020), who revealed that there was an evident decrease in labor induction between warm compresses and hands-on groups during the 2nd stage of labor. Concerning the duration of the second stage of labor, the present study showed that the lubricated massage group had the lowest mean duration, compared to the warm compresses group, while the routine hospital care group had the longest mean duration. These findings may be explained as neither perineal lubricated massage nor perineal warm compresses during the 2nd stage of labor had reduced the length of the 2nd stage, compared to the control group. From the researcher's point of view, such a contradiction may be attributed to the difference in the duration and frequency of application of the lubricant perineal gel.

The study findings come in agreement with Ibrahim et al., (2017), who reported that perineal warm compresses and perineal lubricated massage during the 2nd stage of labor had reduced the length of the 2nd stage, compared to the routine hospital care.

These findings were also supported by Seval et al., (2017), who studied "the effectiveness of obstetric gel on the process and duration of labor", and reported that the mean duration of the 2nd stage of labor was significantly shorter in the obstetric gel group than the control group. From the researcher's point of view, the lubricant gel administration started after fully cervical dilatation at the beginning of the 2nd stage while in the contradictory studies the lubricant gel application started in the early 1st stage of labor (before 4 cm cervical dilation) and ended with childbirth. So, the application of lubricant gel took more duration and frequency in the contradictory studies than in the current one.

These findings come in contrast with Ashwal et al., (2016) who conducted "a randomized controlled clinical trial to evaluate the effectiveness of obstetric gel on the length of 2nd stage of labor and perineal integrity", and reported that the mean length of the 2nd stages of labor was short than the study and control groups.

These findings also come in no contrast with Ashwal et al., (2020), who conducted a randomized controlled clinical trial to "evaluate the effectiveness of obstetric gel on the length of 2nd stage of labor and perineal integrity", and reported that the mean length of the 2nd stage of labor was similar in the study and control groups.

Concerning the mean newborn birth weight, the present study showed that

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the mean fetal birth weight was higher among mothers in the lubricated massage group than both warm compresses or control groups, and the mean fetal birth weight was within normal range among the three study groups.

This study is in accordance with Goh et al., (2021), who studied "combined massage and warm compresses to the perineum during the active second stage of labor in nulliparas", and summarized that the mean newborn weight was within the normal range among the intervention groups.

These findings were also supported by Gaheen & Abo-Hatab, (2021), who revealed that the mean newborn weight was within the normal range among the four study groups.

Concerning perineal integrity after delivery, the present study findings shows that women who received lubricated massage during the second stage of labor experienced a lower adverse perineal integrity than those who received either hot compresses or those who received the routine hospital care.

The study findings were in agreement with Oglak & Obut, (2020), 'who investigated 'Effectiveness of Perineal Massage in the Second Stage of Labor in Preventing Perineal Trauma', and stated that a significant benefit of perineal massage concerning the rate of perineal trauma among nulliparous women. The intact perineum rates were significantly higher in the massage group than the control group.

The study findings were supported by Modoor et al., (2021), who investigated "the effect of warm compresses on perineal tear and pain intensity during the second stage of labor", and reported that the warm compresses group had lower degrees of perineal tear than the control group.

These findings were also supported by Haryanti, (2019) who investigated "The effect of perineal massage on perinatal status and duration of labor", and the perineal massage had an impact on the perineal status. From the researcher's point of view, the perineal massage reduces stress and pressure, as well as increases the perineal muscles relaxation and perineal blood flow.

As for the comparison between warm compresses and perineal massage groups and control group regarding the perineal trauma, the present study findings showed that there was a highly statistically significant difference among the study women of the three groups. Regarding the rate of episiotomy, there was significant effect of warm compresses technique on reducing the rate of episiotomy. This might be because of that the warm compresses technique can cause perineal relaxation, which can a protective factors against severe perineal trauma. This finding is supported by Rezaei et al., (2020) who compare the hands off and hands on methods to reduce perineal lacerations and stated that application of the hands off method for vaginal delivery has a positive effect on the mother's health because of the reduction of episiotomy and third degree tearing. Also, Pierce, et al., (2021) compared the frequency and degree of perineal rupture in hands-off and hands-on techniques of protecting perineum during labor and found that the prevalence of episiotomy was less in hands off group compared to hands on group

The current study findings are similar to those of other studies like that conducted by Christine et al., (2020) and Aasheim et al., (2017) who studied the effect of perineal supportive techniques during the second stage of labor on reducing the incidence of perineal trauma and showed that

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perineal supportive techniques used during the second stage of labor have positive effect on reducing the incidence of perineal trauma.

On the same line, Amanda et al., (2021) studied the perineal management techniques among midwives at five hospitals in New South Wales and stated that the hands off technique is a safe and recommended technique for perineal management and discussions of such a technique should be included in all midwifery education and training programs. In contradiction with these findings are those of Pergialiotis et al., (2022) who studied the incidence and risk factors for perineal trauma and found that no evidence in favor of hands on or hands off technique. Similarly, Hannah and Webb (2020) who stated that there was no evidence to support the use of hand maneuvers for reducing perineal trauma. This might be because of different population or different selection criteria.

Regarding the degrees of perineal tear, the present findings revealed that the lower incidence of third and fourth degree perineal tear was found in warm compresses group compared to perineal massage and control groups. This study finding is supported by Wang et al., (2022) who studied the effect of hands on techniques on obstetric perineal laceration and stated that third degree trauma and episiotomy were slightly more common in the hands on group and periurethral tears that did not need mending were more common in the control group. The researcher points of view that the pressure exerted by one of the hands on the fetal head to protect the anterior region of the perineum pushes the head away from the pubic arch toward the posterior region, increasing the frequency of

perineal lacerations in the posterior region.

In contradiction with these findings are those of Limbeek et al., (2022) who studied the effectiveness of non-surgical intrapartum practices in reducing the incidence of severe perineal trauma (third and fourth degree tears) during childbirth and found that women in the hands on group had a decreased chance of a third or fourth degree tear.

The present study showed that the prevalence of episiotomy was significantly lower in the warm compresses group compared with the control group. This might be because of heat increases local skin temperature, circulation, and tissue metabolism. It reduces muscle spasm and raises the pain threshold. The results of the present study agree with the results of Akbarzadeh et al., (2018) who studied the effect of warm compress intervention on the rate of episiotomy, perineal trauma, and postpartum pain intensity in primiparous women and stated that warm compress intervention was effective in reducing episiotomies, the mean length of episiotomy incision and increasing the rate of intact perineum.

The present study findings were consistent with the findings of the study conducted by Aasheim et al., (2017) who studied the effect of perineal techniques during the second stage of labor for reducing perineal trauma and concluded that there was reasonable data to support the use of warm compresses on the perineum during the birth, which resulted in a reduction in perineal trauma.

On the same line, Mohamed et al., (2019) performed a comparative study between two perineal management techniques during the second stage of labor for reducing the incidence of perineal trauma and found that the use

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of warm compresses in the perineum during the expulsive period reduce the occurrence of perineal laceration. These results support the use of perineal warm compresses techniques by trained birth attendants. Also, Dahlen et al., (2017) concluded in their recent study that warm compresses should be offered to women as second stage comfort as they are associated with a reduction in severe perineal trauma and are acceptable to women. These findings may reflect the benefits of applying warm compresses on the perineum during the second stage of labor.

The present study revealed that the prevalence of episiotomy was significantly lower in the perineal massage group compared to the control group. The reason may be explained by that perineal massage during the second stage of labor increases the blood flow, softens the perineal tissues and made it more flexible. Massage therapy have several advantages, including reduction of stress and pressure, enhancement of blood circulation and relief of pain. Furthermore, since the perineal muscles surrounding the vaginal orifice are stretched they are less likely to incur damage. The finding of the present study was consistent with the finding of the study conducted by Demirel and Golbasi (2021) who studied the effect of perineal massage on the rate of episiotomy and perineal tearing and found that application of perineal massage during active labor decreased the frequency of episiotomy procedures. So, it seems that the perineal massage could be an effective way to preserve an intact perineum in labor. Similarly Dieb et al., (2020) stated that perineal massage before labor decreased the rate of perineal stitches in primiparous women.

In contradiction with the present study finding, Botelho (2017) who studied the effect of perineal massage on the incidence of episiotomy and perineal laceration found that perineum massage with lubricant did not affect episiotomy and perineal tears. So, perineal massage with a sterile lubricant did not provide any apparent and significant advantage or disadvantage in reducing perineal trauma. Also, Biju et al., (2020) did not observe a difference in episiotomy rate between the massage and control groups. This might be explained by the presence of fetal macrosomia, instrumental birth or massage during pregnancy.

The present study finding showed that the prevalence of third and fourth degree perineal tears were significantly lower in the massage group compared with the control group. This finding was in agreement with the finding of study conducted by Aasheim et al., (2017) who studied the effect of perineal techniques during the second stage of labor on reducing perineal trauma and stated that perineal massage reduced the third and fourth degree perineal tears compared with control group. On the same line, Geranmayeh et al., (2022) studied the effect of perineal massage with Vaseline in the second stage of labor on reducing the incidence of perineal trauma and found that there was an increase in the frequency of spontaneous perineal tears in perineal massage compared with control group but none of the tears were qualified as third or fourth degrees.

In contradiction with these findings are those of Gimovsky and Berghella (2022) who stated that there was high-level evidence that intrapartum perineal massage or application of warm compresses or using hands off in

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the second stage of labor does not improve the perineal outcomes.

The findings are not consistent with a study done by Ibrahim et al., (2017) which revealed that, using perineal warm compresses or perineal lubricated massage in 2nd stage of labor didn't significantly reduce the incidence of spontaneous perineal trauma or episiotomy when compared to a routine hospital care group.

The findings are not consistent with a study done by Aasheim et al., (2017) who investigated the "Perineal techniques during the 2nd stage of labor for reducing perineal trauma", and revealed that perineal warm compresses didn't have any clear effect on the occurrence of intact perineum, perineal trauma requiring suturing or episiotomy.

In addition, the study revealed that, using perineal warm compresses or perineal lubricated massage during the 2nd stage of labor didn't significantly reduce the incidence of spontaneous perineal trauma or episiotomy when compared to routine care group.

The present study also revealed that the first-degree tear is the most common tear that occurs during labor among the three groups.

The study findings were in agreement with Gaheen & Abo-Hatab (2021) who revealed that the first degree perineal tear was the most common among the control group.

These findings come in contrast with Ibrahim et al., (2017) who revealed that the second-degree perineal tear is the most common tear that occurs during labor among the three groups. From the total parturient experienced perineal tears, second-degree tears occurred in less than one-third of the warm compresses group women, and less than one-quarter in the lubricated massage group, compared to more than half in the control group. Moreover,

two cases only were detected in the control group with third-degree tear and no fourth-degree tear was detected among the three groups. From the researcher's point of view, perineal tears may occur due to other causes such as duration of 2nd stage, fetus weight, and difficulty of 2nd stage of labor.

In this study, the researcher found that perineal supportive techniques during the second stage of labor are effective and acceptable techniques in reducing the incidence of perineal trauma and should be a standardized part of the second stage of perineal care as they improve the outcomes in terms of increasing the incidence of intact perineum and lowering the risk of episiotomy and severe perineal trauma.

Conclusions

In the light of the present study results, it can be concluded that:

- The use of warm compresses was effective in reducing the degree of perineal tears and the degree of extension of episiotomy as it increase blood supply by vasodilation, provide comfort during late second stage and encourage tissue flexibility so that warm compresses reduce the duration of the second stage of labor when compared to the hospital care group. This supports the first research hypothesis.
- Also, the lubricated massage was effective in reducing the degree of perineal tears and the degree of extension of episiotomy by softens the skin, improves elasticity, increases in blood flow, helping a mother with a sense of tingling, burning and thus sense of less pressure and tension, followed by the withdrawal of the baby's head, and increases the ability of the perineum to stretch, so lubricated massage reduce the duration of the

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second stage of labor when compared to the hospital care group and warm compresses group. This supports the second research hypothesis.

- Lubricated massage was more effective than warm compresses and routine hospital care in this respect.
- Based on the present study findings, the research hypotheses are accepted.

Recommendations

Based on the study findings the following were recommended:

- 1) Advice using non-pharmacological methods for primiparous women as it reduce the complications of episiotomy and perineal tears.
- 2) Perineal lubricated massage and perineal warm compresses should be incorporated during the second stage of labor as perineal protecting techniques.
- 3) Further researches are also recommended :
 - The effect of warm compresses on other pains encountered during the menstrual cycle.
 - Assessment of laboring women's satisfaction with the use of perineal warm compresses for management of second stage of labor.
 - Replication of the present study at different sittings and among different subjects.

References

- Akbarzadeh, M., Vaziri, F., Farahmand, M., Masoudi, Z., Amooee, S., & Zare, N. (2018). The effect of warm compress bistage intervention on the rate of episiotomy, perineal trauma, and postpartum pain intensity in primiparous women with delayed Valsalva maneuver referring to the selected hospitals of Shiraz University of Medical Sciences in 2012-2013. *Advances in Skin & Wound Care*, 29(2), 79-84.
- Al Ghamdi, D. S. (20¹^). A retrospective study of the incidence and predisposing factors of third-and fourth-degree perineal tears. *Saudi Medical Journal*, 41(11), 1241.
- Amanda, H., Natasha, D., Foureur, M., Spear, V., & Dominiek, C. (2021). Exploring unwarranted clinical variation: The attitudes of midwives and obstetric medical staff regarding induction of labour and planned caesarean section. *Women and Birth*, 34(4), 352-361.
- André, K., Stuart, A., & Kallén, K. (2021). Obstetric Anal Sphincter Injuries–Maternal, Foetal and Sociodemographic Risk Factors: A Retrospective Register-Based Study. *Authorea Preprints*.
- Aquino, C. I., Guida, M., Saccone, G., Cruz, Y., Vitagliano, A., Zullo, F., & Berghella, V. (2020). Perineal massage during labor: a systematic review and meta-analysis of randomized controlled trials. *The Journal of Maternal-Fetal & Neonatal Medicine*, 33(6), 1051-1063.
- Ashwal, E., Aviram, A., Wertheimer, A., Krispin, E., Kaplan, B., & Hirsch, L. (2016). The impact of obstetric gel on the 2nd stage of labour and perineal integrity: a randomized controlled trial. *Journal of Maternal –Fetal &*

Effect of Warm Compresses Versus Lubricated Massage During the Second Stage of Labor on Perineal Integrity Among Primiparous Women

- Neonatal Medicine, 29(18), 3024-3029
- Ashwal, E., Livne, M. Y., Benichou, J. I., Unger, R., Hirsch, L., Aviram, A., ... & Yogev, Y. (2020). Contemporary patterns of labor in nulliparous and multiparous women. *American journal of obstetrics and gynecology*, 222(3), 267-e1.
- Biju, A. S., Salunkhe, J. A., Salunkhe, A. H., Kakade, S. V., Nair, L., & Patange, R. P. (2020). A Study to Assess the Effect of Prenatal Perineal Massage on Gestational Age, Duration of 1st and 2nd Stage of Labour. *Journal of Krishna Institute of Medical Sciences (JKIMSU)*, 9(2).
- Botelho, C. M. (2017). A influência da massagem perineal na incidência do trauma perineal no segundo período de trabalho de parto (Doctoral dissertation).
- Bulchandani, S., Watts, E., Sucharitha, A., Yates, D., & Ismail, K. M. (2022). Manual perineal support at the time of childbirth: a systematic review and meta-analysis. *BJOG: An International Journal of Obstetrics & Gynaecology*, 122(9), 1157-1165.
- Christine. E., Lau, R., & Biro, M. A. (2020). Midwives' and doctors' perceptions of their preparation for and practice in managing the perineum in the second stage of labour: A cross-sectional survey. *Midwifery*, 31(1), 122-131.
- Dahlen, H. G., Homer, C. S., Cooke, M., Upton, A. M., Nunn, R., & Brodrick, B. (2017). Perineal outcomes and maternal comfort related to the application of perineal warm packs in the second stage of labor: a randomized controlled trial. *Birth*, 34(4), 282-290.
- Demirel, G., & Golbasi, Z. (2021). Effect of perineal massage on the rate of episiotomy and perineal tearing. *International Journal of Gynecology & Obstetrics*, 131(2), 183-186.
- Durnea, C. M., Jaffery, A. E., Gauthaman, N., & Doumouchsis, S. K. (2018). Effect of body mass index on the incidence of perineal trauma. *International Journal of Gynecology & Obstetrics*, 141(2), 166-170.
- Dutta, D., Kim, J., Sarkes, M., Nath, S., & Markoulli, M. (2019). The repeatability of subjective and objective tear ferning assessment and its association with lipid layer thickness, non-invasive tear break-up time and comfort. *Contact Lens and Anterior Eye*, 42(4), 420-427.
- Essa, N., Saleh, M. A., Mostafa, R. M., Taha, E. A., & Ismail, T. A. (2019). Prevalence and factors associated with warts in primary school children in Tema District, Sohag Governorate, Egypt. *Journal of the Egyptian Public Health Association*, 94(1), 1-6.
- Fahmy, M. W., Sangneria, T., & Munakomi, S. (2021). Anatomy, Abdomen and Pelvis, Superficial Perineal Space. *StatPearls*.
- Gaheen, M. A., & Abo-Hatab, T. A. E. S. (2021). Effect of Utilizing Perineal Massage, Warm

Effect of Warm Compresses Versus Lubricated Massage During the Second Stage of Labor on Perineal Integrity Among Primiparous Women

- Compresses and Hands on Techniques during the Second Stage of Labor on Perineal Outcomes. *Tanta Scientific Nursing Journal*, 23(4), 36-60.
- Geranmayeh, M., Rezaei, Z., Fallahkish, B., Farahani, M. A., Khakbazan, Z., & Mehran, A. (2022). Reducing perineal trauma through perineal massage with vaseline in second stage of labor. *Archives of Gynecology and Obstetrics*, 285(1), 77-81.
- Gimovsky, A. C., & Berghella, V. (2022). Evidence-based labor management: second stage of labor (part 4). *American journal of obstetrics & gynecology MFM*, 4(2), 100548.
- Goh, Y. P., Tan, P. C., Hong, J. G. S., Sulaiman, S., & Omar, S. Z. (2021). Combined massage and warm compress to the perineum during active second stage of labor in nulliparas: A randomized trial. *International Journal of Gynecology & Obstetrics*, 155(3), 532-538.
- Hannah, G., D., Webb, S. (2020). The OASI Care Bundle—a lively topic for discussion. *MIDIRS Midwifery Digest*, 30(4), 414-417.
- Harris, N. (2020). Vaginal tearing is a common side effect of giving birth. Learn about four different degrees of perineal tears and how they heal.
- Haryanti, P. (2019). The effect of perineal massage on perineal status and duration of labor. *Jurnal Keperawatan Soedirman*, 14(2).
- Ibrahim, H., Elgzar, W. T. I., & Hassan, H. E. (2017). Effect of warm compresses versus lubricated massage during the second stage of labor on perineal outcomes among primiparous women. *IOSR Journal of Nursing and Health Science*, 6(4), 64-76.
- Jansson, M., Franzén, K., Hiyoshi, A., Tegerstedt, G., Dahlgren, H., & Nilsson, K. (2020). Risk factors for perineal and vaginal tears in primiparous women—the prospective POPRACT-cohort study. *BMC pregnancy and childbirth*, 20(1), 1-14.
- Kamel, H. A. H., & Ibrahim, A. S. M. (2018). Maternal Obesity and Its Effect in Late Pregnancy and Labour. *The Egyptian Journal of Hospital Medicine*, 71(4), 2982-2988.
- Limbeek, S., Davis, D., Currie, M., & Wong, N. (2022). Non-surgical intrapartum practices for the prevention of severe perineal trauma: a systematic review protocol. *JBIC Evidence Synthesis*, 14(4), 30-40.
- Magoga, G., Saccone, G., Al-Kouatly, H. B., Dahlen, H., Thornton, C., Akbarzadeh, M., ... & Berghella, V. (2019). Warm perineal compresses during the second stage of labor for reducing perineal trauma: A meta-analysis. *European Journal of Obstetrics & Gynecology and Reproductive Biology*, 240, 93-98.
- Mandeville, A., & Little, L. M. (2019). Pushed out or opting out? Integrating perspectives on gender differences in withdrawal attitudes during pregnancy. *Journal of Applied Psychology*, 104(8), 985.
- Mansour, S., Hemida, R., & Gouda, A. (2021). Placental Cord

Effect of Warm Compresses Versus Lubricated Massage During the Second Stage of Labor on Perineal Integrity Among Primiparous Women

- Drainage: Its Effect on Duration and Blood loss of Third Stage of Labor.
- Meutter, L., van Heesewijk, A. D., van der Woerdt-Eltink, I., & de Leeuw, J. W. (2018). Implementation of a perineal support programme for reduction of the incidence of obstetric anal sphincter injuries and the effect of non-compliance. *European Journal of Obstetrics & Gynecology and Reproductive Biology*, 230, 119-123.
- Modoor, S., Fouly, H., & Rawas, H. (2021). The effect of warm compresses on perineal tear and pain intensity during the second stage of labor: A randomized controlled trial. *Belitung Nursing Journal*.
- Mohamed, H. S., & Elkheshen, S. A. (2017). Effect of manual fundal pressure during the second stage of labor on maternal outcomes among parturient women. *Am J Nurs*, 5(4), 109-14.
- Mohamed, M. L., Mohamed, S. L., & Gonied, A. S. (2019). Comparative study between two perineal management techniques used to reduce perineal trauma during 2nd stage of labor. *Journal of American Science*, 7(11), 228-232.
- Monem, A. H. A. A., El-Habashy, M. M. I., & Yonis, S. H. M. (2020). Effect of Hands-on, Hands-off and Warm Compresses Perineal Techniques during the 2 nd stage of labor on Perineal Outcomes among Primiparae with Vaginal Delivery.
- Murray, D. S. (2019). The precarious new faculty majority: Communication and instruction research and contingent labor in higher education. *Communication Education*, 68(2), 235-245.
- Naidu, M., Thakar, R., Jordan, P. A., & Sultan, A. H. (2018). Effect of subsequent vaginal delivery on bowel symptoms and anorectal function in women who sustained a previous obstetric anal sphincter injury. *International Urogynecology Journal*, 29(11), 1579-1588.
- Oglak, S. C., & Obut, M. (2020). Effectiveness of perineal massage in the second stage of labor in preventing perineal trauma. *Gynecology obstetrics & reproductive medicine*, 26(2), 88-93.
- Pergialiotis, V., Vlachos, D., Protopapas, A., Pappa, K., & Vlachos, G. (2022). Risk factors for severe perineal lacerations during childbirth. *International Journal of Gynecology & Obstetrics*, 125(1), 6-14.
- Petrocnik, P., & Marshall, J. E. (2019). Hands-poised technique: The future technique for perineal management of second stage of labour? A modified systematic literature review. *Midwifery*, 31(2), 274-279.
- Pierce, R. A., Saccone, G., & Berghella, V. (2021). Hands-on versus hands-off techniques for the prevention of perineal trauma during vaginal delivery: a systematic review and meta-analysis of randomized controlled trials. *The Journal of Maternal-Fetal & Neonatal Medicine*, 34(6), 993-1001.

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- Rezaei, R., Saatsaz, S., Chan, Y. H., & Nia, H. S. (2020). A comparison of the “hands-off” and “hands-on” methods to reduce perineal lacerations: a randomised clinical trial. *The Journal of Obstetrics and Gynecology of India*, 64(6), 425-429.
- Royal College of Obstetricians and Gynecologists Green-top Guideline (2022) No. 29: The Management of Third- and Fourth-Degree Perineal Tears. Retrieved from <https://www.rcog.org.uk/en/guidelines-research-services/guidelines/gtg29/>
- Seval, M. M., Yüce, T., Yakıştıran, B., Şükür, Y. E., Özmen, B., Atabekoğlu, C., ... & Söylemez, F. (2017). Effects of obstetric gel on the process and duration of labour in pregnant women: randomised controlled trial. *Journal of Obstetrics and Gynaecology*, 37(6), 714-718.
- Sharma, S. K., Mudgal, S. K., Thakur, K., & Gaur, R. (2020). How to calculate sample size for observational and experimental nursing research studies. *National Journal of Physiology, Pharmacy and Pharmacology*, 10(1), 1-8.
- Tanos, V., & Toney, Z. A. (2019). Uterine scar rupture-Prediction, prevention, diagnosis, and management. *Best Practice & Research Clinical Obstetrics & Gynaecology*, 59, 115-131.
- Wang, H., Jayasekara, R., & Warland, J. (2022). The effect of “hands on” techniques on obstetric perineal laceration: A structured review of the literature. *Women and Birth*, 28(3), 194-198.
- Williams, R. A., Saccone, G., & Berghella, V. (2021). Hands-on versus hands-off techniques for the prevention of perineal trauma during vaginal delivery: a systematic review and meta-analysis of randomized controlled trials. *The Journal of Maternal-Fetal & Neonatal Medicine*, 34(6), 993-1001.
- World Health Organization (WHO). (2018). Intrapartum care for a positive childbirth experience [Internet]. Geneva, Available from: <https://www.who.int/reproductivehealth/publications/intrapartum-care-guidelines/en/>
- Yap, E., Ypil, A., Galbo, P., Tremedal, A., and Diaz-Roa L. (2019). Comparison on the Effect Of —Hands on versus —Hands off Method On Perineal Trauma And Delivery Outcome Among Nulliparous Women. *Philippine Obstetrical and Gynecological Society (POGS)*; 38(2): 1
- Zare, O., Pasha, H., & Faramarzi, M. (2014). Effect of perineal massage on the incidence of episiotomy and perineal laceration. *Health*, 2014, 94(1), 1-6.