Effect of Lavender Oil Drops Application on Perineal Pain Intensity and Episiotomy Wound Healing Among Primiparous Women

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Abstract:

Background: *Worldwide, perineal discomfort and dyspareunia are the most common problems encountered postnatally occurring in 42% of women undergoing vaginal birth. Perineal pain is worsening following instrumental delivery, episiotomy, or spontaneous tears. Episiotomy may be a major risk factor for infection, blood loss, decrease of sexual pleasure, delayed healing, fistula, incontinence of urine, feces and flatus. Many comfort measures have been recommended to reduce perineal pain and improve episiotomy wound healing. The use of essential oils is among the earliest methods adopted for episiotomy wound healing and pain relief. Lavender oil is traditionally believed to have sedative, anti-depressive and anti-inflammatory properties, in addition to its recognized antimicrobial effects.* ***Objective:*** *To determine the effect of lavender oil drops application on perineal pain intensity and Episiotomy wound healing among women.* ***Design:*** *Quasi- experimental research design was utilized in this study.* ***Setting:*** *The study was conducted at the post-natal unit of El-Shatby Maternity University Hospital in Alexandria.* ***Subjects:*** *A convenient sample of 80 primiparous women were selected from the previously mentioned setting.* ***Tools:*** *Four tools were used for data collection.* ***The first tool*** *was basic data structured interview schedule.* ***The second tool*** *was pain intensity visual analog scale (VAS).* ***The third tool*** *was a modified version of Chamber Price pain rating scale (CPPRS).* ***The fourth tool*** *was wound healing REEDA scale.* ***Results:*** *There was a statistically significant difference between the two groups in relation to perineal pain intensity using (VAS) after 10^{th} postnatal days ($p = 0.018$) from intervention .Regarding the total score of episiotomy healing process, using REEDA, there was a highly statistically significant difference between the two groups regarding perineal healing scores ($p = 0.000$) during the 5^{th} postnatal days and after 10^{th} postnatal days ($p < 0.0001$).* ***Conclusion:*** *Primiparous women who apply lavender oil drops exhibit less perineal pain intensity and more positive signs of episiotomy wound healing than those who use routine hospital episiotomy care.* ***Recommendations:*** *In service training program for nurses in postpartum units about the utilization of non- pharmacological approaches especially using lavender oil to improve wound healing and perineal pain.*

Key words: Lavender oil, Episiotomy wound healing, Perineal pain intensity, Primiparous women.

Introduction

Postnatal period is expected to be a joyful experience, yet it is a critical transitional period of time for women in which there are several physiological, psychological and social adaptations especially for primiparae (Finlayson et al., 2020).

During postpartum period, minor discomforts may quickly develop leading to serious long-lasting morbidities. One of these morbidities is the perineal trauma that can arise following normal childbirth. Perineal trauma or genital tract injury occurs in more than 65% of all vaginal births and is generally the result of either spontaneous laceration or episiotomy or both (Mousavi et al., 2021). Episiotomy is a deliberately planned surgical incision on the perineum during the second stage of labor to widen the vaginal opening and facilitate delivery (Garner et al., 2021).

Nonetheless, Episiotomy is considered as one of the most commonly practiced obstetric procedures. The World Health Organization (WHO) recommends its limited use in about 10% of normal deliveries. In the last decade, episiotomy was performed in 70% of normal vaginal deliveries (World Health Organization [WHO], 2018).

The process of episiotomy surgery usually results in injury and pain of the perineum. (Mousavi et al., 2021). More than 90% of perineal pain can occur in the first day of childbirth, and as many as 88% of pain cases will subside within 2 months after childbirth. The presence of perineal trauma increases the chance of having local pain among the primiparous women by about three times compared to those who have intact perineum. Poor handling of perineal wounds can also result in infection of the wound (Gomaa et al., 2019) .

Several interventions are available for the management of perineal discomfort, reducing perineal pain; edema and redness. These interventions include Pharmacological and non-pharmacological treatments. They have been investigated for perineal pain control after vaginal delivery and upgrade wound healing process. Non pharmacological treatments include ice pack application, warm sitz baths, infra- red therapy, perineal care and performance of kegel's exercises and utilization of herbs and essential oils (Desplanches et al., 2019).

Today, lavender oil (Lavandula angustiofolia) is one of the most popular essential oils in the world. It has both physiological and psychological actions. Physiological actions include anti-histaminic and anti-inflammatory activities. Traditionally, lavender oil is considered to have a balancing effect on the central nervous system acting as a calming agent. While, psychological actions of lavender oil include sedative and anxiolytic effects (Lee et al., 2018).

The maternity nurse has a significant role in the management of both episiotomy wound and perineal discomfort. Her primary goal of care is prevention rather than treatment. Maternity nurses can focus on strengthening the pelvic floor muscles during pregnancy, preservation of the perineum to be intact during delivery to prevent tears and lacerations as well as taking care of the postnatal mothers with episiotomy (Fagerstrom-Sade et al., 2021).

Moreover, she can provide ongoing discomfort assessment and observing the effect of treatment. In addition to, teaching woman post episiotomy care, related pain-relief, kegel exercise and self-care measures (Hinz et al., 2022).

Pain relief in labor assumes a high priority of midwifery care, the available literature concerning women's experience of pain following a normal vaginal delivery suggests that this has been a somewhat neglected area of interest. Also, puerperal women, their families and health professionals tend to devalue perineal pain, since the newborn care becomes a priority in this period. So, this study was conducted

Aim of the study

The aim of the study is to:

Determine the effect of lavender oil drops application on perineal pain intensity and episiotomy wound healing among primiparous women.

Research hypotheses:

- Primiparous women who apply lavender oil drops exhibit less perineal pain intensity than those who use routine hospital episiotomy care.
- Primiparous women who apply lavender oil drops exhibit more positive signs of episiotomy wound healing than those who use routine hospital episiotomy care.

Materials and Method

Materials:

Research design:

Quasi-experimental research design was utilized in this study.

Settings:

The study was conducted at the post-natal unit of El-Shatby Maternity University Hospital in Alexandria.

Subjects:

A convenient sample of 80 primiparous women was selected from the previously mentioned setting according to the following inclusion criteria:

- At the first 4-6 hours after delivery.
- Had a normal vaginal delivery with episiotomy.
- Complaining of perineal pain.
- Do not use any pain relieving drug.
- Free from any known diseases or health problems which may affect the healing process such as diabetes and skin disorders.

- Epi info 7 statistical program was used to estimate the sample size using the following parameters:

a.Population size 1300 over 3month
b.Expected frequency 50%
c.Acceptable error 10%
d.Confidence coefficient 95%
e.Minimal sample size 80

Tools: In order to collect the necessary data for the study, four tools were used:

Tool (I): Basic data interview schedule:

This tool was developed by the researcher and included 2 parts: **Part one:** Socio-demographic characteristic and clinical data of the participants such as age, level of education, occupation etc. **Part two:** Women's knowledge regarding perineal care such as importance of perineal care, technique and frequency of perineal care etc.

- It consists of 17 questions to which the subjects were asked to respond to them all. Their response was scored as follows:
- The correct answer =1
- The incorrect one or didn't know = 0

The scoring system was ranked as follows:

- Poor knowledge <50% (8.5).
- Average knowledge 50-70 % (8.5 ≤ 12).
- Good knowledge >70% (12-17).

Tool (II): Pain intensity visual analog scale (VAS):

- This tool was originally developed by Melzac and Katz (1994). It was adopted and used by the researcher to assess the subjective level of pain. The total score ranges from 0-10 as follows:
  - No pain (0)
  - Mild pain (1-3)
  - Moderate pain (4-6)
  - Severe pain (7-9)
  - Unbearable pain (10)

Tool (III): A modified version of Chamber Price pain rating scale (CPPRS):

- It was originally developed by Chambers and Price (1967) .It was used to measure the behavioral responses to pain. It was adopted and used by the researcher. It measures pain intensity through observable behaviors. It includes (12) items divided into four categories: postures, gross motor activity, facial expression and verbalization. The total score ranges from (0-8). This score was translated to the corresponding pain intensity as follows:
  - No pain (0)
  - Mild pain (1-2)
  - Moderate pain (3-4)
  - Severe pain (5-6)
  - Unbearable pain (7-8)

Tool (IV): Wound Healing REEDA Scale

- This tool was originally developed by Davidson (1974) and then reconstructed by Hill (1990). This tool was used to assess the episiotomy healing process. It appraised the perineum for 5 healing signs: Redness, Edema, Ecchymosis, Discharge and Approximation. The total score of healing process is ranked as follows:

  - Complete healing (< 5)
  - Partial healing (5-< 10)
  - No healing (10-15)

Method:

- Approval was obtained from the Research Ethics Committee. An official letter from the Faculty of Nursing, University of Alexandria was submitted to the responsible authorities of the previously mentioned setting to carry out the study.
- Lavender oil was prepared by a specialist from Faculty of Pharmacy, Alexandria University
- After reviewing the recent relevant literature, tool (I) was developed by the researcher.
- Tools II, III &IV were adopted and translated into Arabic language and the necessary modifications were done.
- Tools were tested for content validity and applicability by jury of (5) experts in the field of obstetric and gynecologic nursing, their suggestions and recommendations were taken into consideration.
- The reliability of the tools was tested using internal consistency test (Cronbach α) where r = (0.816, 0.809, 0.903) respectively.
- A pilot study was carried out on 8 parturients to ensure the clarity and applicability of the tools, identify obstacles and problems that may be encountered as well as to estimate the time needed for data collection. Accordingly, the necessary modifications were made. Women participated in the pilot study were excluded from the study sample.
- The data collection started from mid of December 2021 until mid of august 2022. The study was conducted through the following phases:

I. Assessment phase:

- The researcher selected 80 primparous women who fulfilled the criteria from the postnatal unit of EL-Shatby Maternity University Hospital in Alexandria.
- They were given an appropriate explanation about the purpose of the study.

- All study subjects were individually interviewed by the researcher within 4-6 hours after childbirth to collect the basic data & knowledge (Tool I), in addition to assessment of episiotomy pain intensity (Tool II and Tool III), as well as to assess the episiotomy wound healing (Tool IV). After the assessment, women were assigned randomly to one of the two groups (study group and control group) 40 subjects in each group.

II. Implementation phase:

- For the study group: The researcher provided each woman with a sterile bottle with a dropper of lavender oil and instructed her to apply 3 drops (0.15 ml) by the dropper on the suture line following aseptic technique (washing hands before and after the application of oil and keeping the dropper away from wound and if the dropper touches the wound, it should be disinfected with alcohol to avoid infection. The respondents were asked to repeat this procedure 2 times per day for 10 postpartum days. Women were instructed to do self-perineal care before intervention.

- For the control group: The researcher instructed the women to use the routine hospital episiotomy care (Perineal care with betadine solution) twice per day for 10 postpartum days.

- Home visits were carried out by the researcher for women who were not able to come to the hospital on the assigned days for follow up in the afternoon of the same day.

III. Evaluation phase:

Women of the two groups were asked to come to the hospital for follow up visits during the morning shift on the 5th and 10th day post-partum. Two tasks were performed:

- Evaluation of the perineal pain intensity using tool (II) and tool (III).
- Evaluation of episiotomy wound healing using tool (IV).
- A daily telephone follow up was maintained to ensure proper continuation of the intervention.

Limitation of the study:

- The researcher excluded 15 subjects from the study group who were unable to complete the study. However, another 15 subjects who fulfilled the criteria of selection were recruited.

Statistical analysis:

Collected data were categorized, coded, computerized, tabulated and analyzed using statistical package for social science (SPSS) version 25 and presented in descriptive and association forms. The necessary tables were then prepared.

Ethical considerations:

For each recruited subject a written informed consent was obtained after explanation of research purpose, the subject's privacy was considered and respected. Confidentiality of the subject's data was assured and respected at all phases, right of voluntary participation and withdrawal of the study subjects at any time was respected.

Results:

Table (1): elaborates number and percent distribution of the study subjects according to their socio- demographic characteristics. .It reveals that *the mean age* was 22.95 ± 2.961years and 22.60 ± 2.753years for study and control groups respectively. There is no statistical significant difference between the two groups in relation to their age, level of education, occupation, type of work, place of current residence and type of family where, P= (0.586, 0.748, 0.605, 0.796, 0.816, 0.653,respectively).

Table (II): clarifies that more than three fifths (62.5%) of the study group had average knowledge compared to 70% of the control group.There is no statistical significant difference between the two groups in relation to their knowledge bout episiotomy and perineal care where, P= (0.677).

Figure (1): denotes that 32.5% and 37.5% of study and control groups respectively, received information regarding episiotomy and perineal care from family and relatives.There was no statistically significant difference between the two groups in relation to their sources of information about episiotomy and perineal care where, P= (0.866).

Table (III): exhibits a comparison between study and control group before and after intervention according to perineal pain intensity, using VAS. It demonstrates that there was no statistically significant difference between the two groups regarding perineal pain intensity using (VAS) before intervention and on 5th postnatal day after intervention where (p = 0.787, 0.209) respectively. There was a statistically significant difference between the two groups in relation to perineal pain intensity on 10th postnatal days after intervention (p = 0.018)

Table (IV): reflects a comparison between the study and control group before and after intervention according to their total score of perineal pain intensity, using CPPRS. There was no statistically significant difference between the two groups regarding perineal pain intensity before intervention and on 5th postnatal day after intervention where (p = 0.274, 0.068) respectively. While there was a highly

statistically significant difference between the two groups in relation to perineal pain intensity on 10th postnatal days after intervention (p = <0.0001).

Table (V): portrays the number and percent distribution of postpartum women according to their total score of episiotomy healing process, using REEDA scale .It reveals that there was a highly statistically significant difference between the two groups regarding perineal healing score by the 5th and 10th postnatal days(p =0.000, p < 0.0001) respectively i.e. women of the study group exhibit more positive signs of episiotomy wound healing to the used intervention on the 5th and 10th day than women in the control group .

Discussion

In relation to the effect of lavender oil drops application on perineal pain intensity: The results of the current study apparently reveal a statistically significant difference between the control and study groups in relation to perineal pain intensity before and after lavender oil drops application, to the favor of the intervention. Where, the score of pain sharply declined among the study group unlike the control group

This result is congruent with the literature which, indicates that lavender oil has sedative, analgesic and calminative effect due to the chemical compounds of its constituents (linalool and linalyle acetate).Linalool inhibits acetylcholine release and alters ion channel function at the neuromuscular junction. Furthermore, linalool and linalyl acetate are rapidly absorbed through the skin after topical application, reaching peak plasma levels after approximately 19 minutes. Linalyl acetate has narcotic actions and linalool acts as a sedative (Chadha & Podder, 2018).

The results of the present study are in line with a study conducted in Indonesia by Nunung et al., (2021) titled "Effectiveness of lavender aromatherapy on perineal pain intensity among postpartum mothers with normal labor". Their results showed that lavender aromatherapy effectively reduced perineal pain in postpartum mothers who experienced perineal trauma. They recommended that practitioners can apply lavender aromatherapy interventions in reducing perineal pain.

Furthermore, Hables (2021) studied" Effect of olive oil, lavender oil and placebo on pain intensity and healing of episiotomy in women at Alexandria in Egypt. Pain was evaluated at the first day, 5th, 9th and14th days following episiotomy. Regarding pain score, there was no difference at the first day between the three groups, while there was significant difference between the three studied groups regarding pain intensity after 9 days where p value was (<0.01).

The same findings are also supported by the systematic review conducted by Moradi et al., (2020) titled "Effect of lavender oil on episiotomy wound healing and pain relief". They recommended lavender oil as the treatment of choice in episiotomy wound healing and pain relief.

The current finding also matches with the systematic review conducted by Rezaie-Keikhaie et al., (2019) about "Effect of aromatherapy on postpartum complications". They illustrated that essential oil can be used to improve different postpartum psychological and physical symptoms including pain.

This harmony between the results of the current study and the previously mentioned ones may be attributed to the fact that lavender oil has physiological actions as anti-histaminic, analgesic and anti-inflammatory activities (Soni et al., 2016).

In relation to the effect of lavender oil drops application on episiotomy wound healing: The results of the present study reveals that the study group exhibits more positive signs of episiotomy wound healing than the control group who use routine hospital episiotomy care. As on the 5th postnatal day, the majority of the study group had complete healing of episiotomy wound compared to small proportion of the control group. Meanwhile on the 10th postnatal day, the entire study group had complete healing compared to none of the control group. On the other hand, a highly statistically significant

difference between the two groups at 5th and 10th postpartum days was observed regarding perineal healing scores (**Table V)**.

The same findings are supported by the findings of Hables (2021) who reported that the REEDA score show no difference between the mean score of scale between the three studied groups at the first postpartum day, while there was highly significant difference between the three studied groups at 5th, 9th and 14th postpartum day at p value <0.01 which indicate improvement of healing of episiotomy wound.

Moreover, the results of the current study are in harmony with the results of Chadha and Podder (2018) who conducted a study to assess the effectiveness of lavender oil sitz bath on episiotomy wound healing among postnatal mothers admitted in selected hospitals of Pune city in India. They illustrated that, initially in the pretest the study and control groups didn't differ in REEDA scoring (p>0.05), while lavender oil sitz bath have significantly improved the episiotomy wound healing among the study group(p<0.05) .

Furthermore, a comparative study done by Mable Vinolia (2018) to evaluate the effectiveness of lavender oil sitz bath and cold gel pack application on episiotomy wound among post natal mothers in primary health center at Trichy District, India. The researcher revealed that the lavender oil group had good wound healing. Also, the paired t test value showed statistically significant difference in episiotomy wound healing in favor of lavender oil group .

Conclusion: Based on the results of the current study, it can be concluded that:

- Application of lavender oil drops seems to be more effective on reducing perineal pain intensity as measured by visual analog scale (VAS) and Chamber Price pain rating scale (CPPRS) than the use of routine hospital episiotomy care (care with betadine).
- Application of lavender oil drops appears to have more positive signs of episiotomy wound healing as measured by REEDA scale than the use of routine hospital episiotomy care. Therefore, the research hypotheses are fulfilled.

Recommendations:

Based on the findings of the present study, the following recommendations are suggested:

-Encourage inservice training programs for nurses in postpartum units about the utilization of non- pharmacological approaches especially using lavender oil to improve wound healing and perineal pain.

-The curricula of basic nursing education as well as continuing education can be enriched with correct and valid evidence about the non-pharmacological management of episiotomy with essential oils.

- Further study about assessment of postnatal women's satisfaction regarding the use of lavender oil for the management of perineal pain and episiotomy healing.

Table (I): Number and percent distribution of postpartum women according to their socio - demographic characteristics

Socio - demographic characteristics	Study Group (n=40)		Control Group (n=40)		t-test (P) F / χ^2 (P)
	No	%	No	%	
Age (years):					
19-	4	10	3	7.5	
20-	23	57.5	27	67.5	0.548
25-28	13	32.5	10	25	(0.586)
Min – Max.	19-28		19-28		
Mean ± SD.	22.95 ± 2.961		22.60 ± 2.753		
Level of education:					
- Illiterate	10	25.0	7	17. 5	1.22
- Primary & preparatory	8	20.0	9	22.5	(0.748)
- Secondary or its equivalent	16	40.0	15	37.5	
- University	6	15.0	9	22.5	
Occupation:					
- Working	9	22.5	11	27.5	0.267
- Housewife	31	77.5	29	72.5	(0.605)
Type of work:	**(n=9)**		**(n=11)**		
- Employee	7	77.8	8	72.7	0.067
- Worker	2	22.2	3	27.3	(0.796)
Current residence:					
- Urban	14	35.0	15	37.5	0.054
- Rural	26	65.0	25	62.5	(0.816)
Type of family:					
- Nuclear	21	52.5	23	57.5	0.202
- extended	19	47.5	17	42.5	(0.653)

χ^2(P): Chi-Square Test &P for χ^2 Test
F (P): Fisher Exact test &P for F Test
*: Significant at P ≤0.05

Table (II): Number and percent distribution of postpartum women according to their total score of knowledge regarding episiotomy and perineal care.

Knowledge about episiotomy and perineal care.	Study (n =40)		Control (n =40)		Test of Sig.	p
	No.	%	No.	%		
Poor (<50%)	12	30.0	8	20.0	χ^2=	^{MC}p=
Average (50- 70%)	25	62.5	28	70.0	1.157	0.677
Good (>70%)	3	07.5	4	10.0		
Total Score (0 – 17)						
Min. – Max.	2.0 – 17.0		2.0 – 16.0			
Mean ± SD.	**9.10 ± 4.22**		**9.53 ± 3.99**			
Median	**10.0**		**10.0**			
% Score					t=	
Min. – Max.	20.0 – 77.27		20.0 – 72.73		0.463	0.645
Mean ± SD.	52.76 ± 15.77		54.65 ± 14.36			
Median	57.19		55.56			

SD: **Standard deviation** **t: Student t-test**
χ^2: **Chi square test** MC: **Monte Carlo**
p: p value for comparing between the studied groups

Figure (1): Percent distribution of postpartum women according to their sources of information about episiotomy and perineal care. ***(#More than one response***)

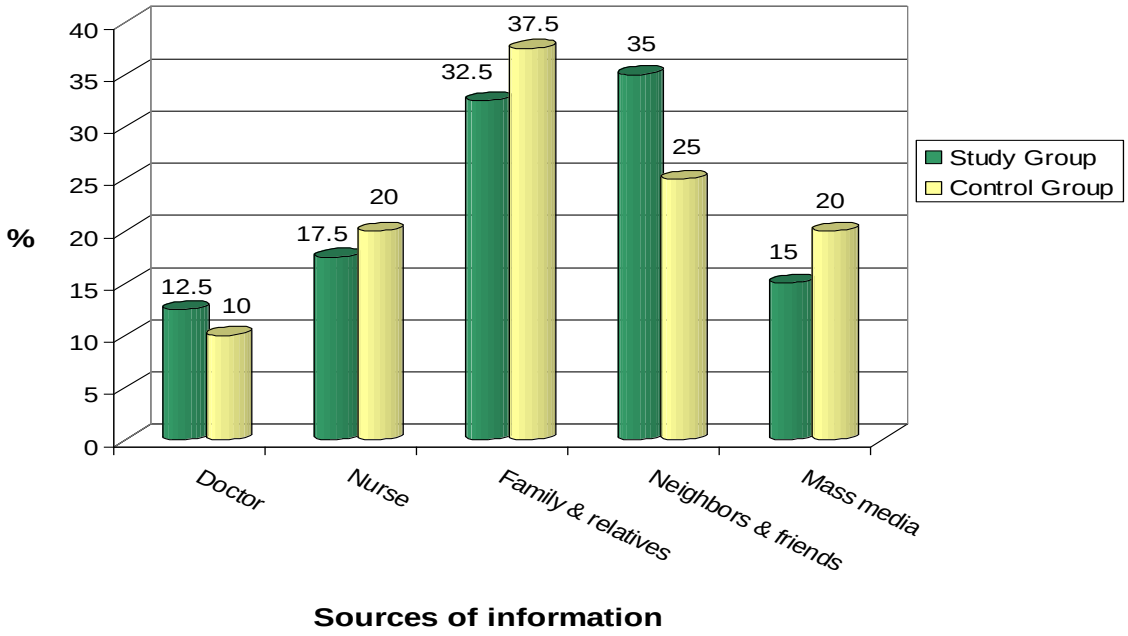

Table (III): Number and percent distribution of postpartum women according to their perineal pain intensity, using VAS

Perineal pain intensity	Study Group (n=40)		Control Group (n=40)		F / χ^2 (P)
	No	%	No	%	
Before intervention:					
- Mild (1-3)	8	20.0	7	17.5	0.48 (0.787)
- Moderate (4-6)	22	55.0	25	62.5	
- Severe (7-9)	10	25.0	8	20.0	
5th day after intervention:					
- Mild (1-3)	19	47.5	18	45.0	3.127 (0.209)
- Moderate (4-6)	21	52.5	19	47.5	
- Severe (7-9)	0	00.0	3	07.5	
10th day after intervention:					
- No pain (0)	5	12.5	0	00.0	8.079 (0.018)*
- Mild (1-3)	28	70.0	25	62.5	
- Moderate (4-6)	7	17.5	15	37.5	

χ^2(P): Chi-Square Test &P for χ^2 Test F (P): Fisher Exact test &P for F Test *: Significant at P ≤0.05

Table (IV): Number and percent distribution of postpartum women according to their total score of perineal pain intensity, using CPPRS

Perineal pain intensity	Study Group (n=40)		Control Group (n=40)		F / χ^2 (P)
	No	%	No	%	
Before intervention:					
- Mild (1-2)	9	22.5	7	17.5	2.588 (0.274)
- Moderate (3-4)	12	30.0	19	47.5	
- Severe (5-6)	19	47.5	14	35.0	
5th day after intervention:					
- Mild (1-2)	23	57.5	14	35.0	
- Moderate (3-4)	17	42.5	24	60.0	5.384

- Severe (5-6)	0	00.0	2	05.0	(0.068)
10th day after intervention: - No pain (0) - Mild (1-2) - Moderate (3-4)	8 31 1	20.0 77.5 2.5	0 26 14	00.0 65.0 35.0	19.705 (<0.0001)**

χ^2 (P): Chi-Square Test &P for χ^2 Test F (P): Fisher Exact test &P for F Test
*: Significant at P ≤0.05 **: Highly significant at P ≤0.05

Table (V): Number and percent distribution of postpartum women according to their total score of episiotomy healing process, using REEDA

Total score of episiotomy healing process	Study Group (n=40)		Control Group (n=40)		F / χ^2 (P)
	No	%	No	%	
Before intervention: - Complete healing (<5) - Partial healing (5-<10)	18 22	45.0 55.0	21 19	52.5 47.5	0.45 (0.502)
5th day after intervention: - Complete healing (<5) - Partial healing (5-<10) - No healing (10-15)	31 9 0	77.5 22.5 00.0	14 22 4	35.0 55.0 10.0	15.874 (0.000)**
10th day after intervention: - Complete healing (<5) - Partial healing (5-<10)	40 0	100.0 00.0	24 16	60.0 40.0	20 (<0.0001)**

χ^2 (P): Chi-Square Test &P for χ^2 Test F (P): Fisher Exact test &P for F Test
*: Significant at P ≤0.05 **: Highly significant at P ≤0.05

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