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Effect of Applying Crushed Ice Gel Pads on Episiotomy Pain and Wound Healing Among Postpartum Primiparous Women

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Abstract: Background: Episiotomy pain is the most common complaint among postpartum women. One of the simple nursing interventions to decrease it and improve the healing process is applying the crushed ice gel pads. The present study *aimed* to evaluate the effect of applying crushed ice gel pads on episiotomy pain and wound healing among postpartum primiparous women. *A quasi-experimental study design* was used. A total of 200 postnatal women (intervention and control group) were selected from the postpartum ward and outpatient clinic at El-Manail maternity Hospital, Egypt. Four *Tools* for data collection were used: “women structured interviewing sheet, Numeric Rating Scale, short-form McGill pain questionnaire, and the standardized REEDA Scale”. The *Results* of the study revealed that the mean age of the sample was 26.8 ± 5.8 years old. There was a statistically significant reduction in the level of episiotomy pain at first day, 3 days, and seven days postpartum between the two groups. Also, the study group REEDA score decreased to 2.72 ± 4.6 and 1.1 ± 3.8 during the posttest. Added to that, most of the intervention group (92.0%) had good episiotomy wound healing while more than half of the control group (57.0%) still has poor and mild healing. **Conclusion:** Women who applied the crushed ice gel pads at postpartum period experienced a lower level of episiotomy pain, had good episiotomy wound healing, and had better ability to perform daily living activities during the posttest than the control group. **Recommendations:** The nurses should be aware of the importance of crushed ice gel pads for postpartum primiparous women, and they should encourage them to apply the crushed ice gel pads at the hospital as well as home to improve their episiotomy wound healing and maintain comfort.

Key words: crushed ice gel pads, episiotomy, wound healing, primiparous women.

INTRODUCTION

Episiotomy is a commonly performed surgical procedure during childbirth delivery and considered as an integral part of labor-management for most women that have proven to be at risk (Golozar et al., 2011; Trinh, Roberts, & Ampt, 2015). It is a surgical perineal incision to widen the vaginal opening just before the baby born in order to shorten baby expulsion period and prevent perineal tears (Carvalho et al., 2010). Episiotomy was thought to prevent urinary incontinence, maternal pelvic organ prolapse, and lacerations that poorly healed. However, recent studies subscribed that there was no evidence that episiotomy protects against maternal pelvic relaxation or fetal intracranial bleeds, it has a risk for increased blood loss, infection, and delayed wound healing (Som & Srirupa, 2017).

Episiotomy is used as a routine care during births as hospital policy (Jiang et al., 2017). In Egypt Mohamed and his colleges (2011) added, that a routine use of episiotomy appears to be the practice of most obstetricians who still use the old teaching, that episiotomy is needed for primiparous women or previously incised multiparous women to avoid perineal laceration. There are two types of episiotomy as; a midline’ and ‘mediolateral’ in the literature and medical practice (Hofmeyr et al., 2011; Hasanpoor et al., 2012).

Worldwide, the incidence of episiotomy was ranged from 20% to 62.5%. In Sweden, the episiotomies rate vary from as low as 9.7% to as high as compared to in Taiwan 100%.

While, the rate of episiotomies was recounted to be about 71% in Germany and 49% in Nigeria (Ahmed, 2015). In India, the birth rate is very high 56% of women had an episiotomy compared to the 46% of white women (Al-Ghamari, 2016; Kartal et al., 2017). A study was done in Egypt by Farghaly et al, (2017) to evaluate the effect of perineal length on the duration of the second stage of labor, the mode of delivery, the need for the episiotomy and the possibility of perineal and vaginal tears needing repair. They found that, out of 483 parturient women, 129 (26.7%) of women did have the episiotomy and most of them are primipara.

Perineal trauma and tears are the most common complications that could occur during the second stage of labor. Perineal tears include any spontaneous or induced (episiotomy) injury to the perineal area or pelvic floor muscles during the second stage of labor (Mohamed & Gonied, 2011; Ibrahim, Elgzar, & Hassan, 2017). Perineal trauma is associated with a high prevalence of certain health problems. Additional health issues, like blood loss, bowel, urinary dysfunction, sexual problems, fatigue, and depression have been also reported. Episiotomy by itself represents a trauma and its suturing may convey more pain to the new mothers, which imposes extra pressure on mothers who attempt to adapt to their new conditions and impact on their daily living activities (Way, 2012; Farghaly et al., 2017). Perineal pain after episiotomy during early puerperal is one of the most common causes of maternal morbidity affecting functions and experience of early

motherhood. Perineal pain is the most significant with its impact on daily activities (Kalis *et al*, 2012; Swain, & Dahlen, 2013; Som & Srirupa, 2017).

Complications of episiotomy also include edema, hematoma, infection, and wound dehiscence (Bharathi, Reddy, & Kote, 2013). Regional pain at the site of incision that may interfere with sitting and if severe leading to retention of urine due to reflex spasm of internal urethral sphincter, infection of the wound and incomplete healing of a tear involving the rectum leads to rectovaginal fistula in addition to dyspareunia due to the presence of tender vaginal scar or narrowing of the vagina (Mohamed *et al*, 2016). The skill of the practitioner conducting the procedure may affect the severity of pain and the healing of perineal wounds (Kettle *et al*, 2010).

Evaluating the postpartum perineal healing has used the visual and verbal assessment (Santos *et al*, 2012; Kaur, Rana, & Suri, 2013; Berens, 2018). Perineal wound healing assessment tools depending merely on visualizing the physical perineal area (REEDA; redness, edema, ecchymosis, discharge, and approximation) are foremost for the research purpose. (Jones, 2011). Nurses appeared systematic in their assessments of perineal healing, using a combination of visual and verbal methods during the first six weeks postpartum (MOH, 2012). In addition, women's self-assessment of perineal healing was advocated by experienced nurses (Jones, 2011). Most women have some degree of discomfort during the first few postpartum days because of episiotomy; pain, infection at episiotomy or surgical site (27.3%), lower abdominal pain (24.8%), and backache (16.8%). The reduction of discomfort and allow the woman to take care of herself and her baby is the main nursing interventions (Mohamed & El-Nagger, 2012).

With proper episiotomy care, the infection can be prevented and healing takes place faster (Rattan *et al*, 2014). Cold-gel packing on the perineum is a suitable, easy to deploy and non-pharmacologic method for pain reduction, with an overall positive impact on postpartum recovery for parturient (Lu *et al*, 2015). Sixty percent of the Australian women reported using icepacks during hospitalization within three days after birth (East *et al*, 2012). These ice packs were handmade by hospital staff. The manufactured gel pads were not widely used related to its high cost (Petersen, 2011). An additional study confirmed that ice treatment is safe, and application times of ten or fifteen minutes are as beneficial as an application time of twenty minutes to relieve perineal pain (Oliveira *et al*, 2012). As well, Navvabi *et al*, (2013) have demonstrated evidence that localized cooling of the perineum reduces the intensity of pain. Women were more satisfied when applying cooling gel pads and this treatment appeared to assist in wound healing. The cooling gel pad is a useful approach to relief perineal pain after episiotomy and reduces the interference of pain with some mental, social and physical activities to reduce the complications of perineum trauma. The recent research confirmed that the use of an ice pack for twenty minutes is effective for alleviating perineal pain and continues to be effective for approximately one an hour (Paiva *et al*, 2016). It was relieved the perineal pain and increased postpartum comfort in all the women (Senol & Aslan, 2017).

Consequently, the obstetric and community health nurses are well positioned to make a significant contribution to managing episiotomy pain for postpartum women. They play a vital role in the overall management of perineal pain and wound healing after episiotomy including continuous pain assessment, application of interventions for pain management, instruct the women about perineal self-assessment and care, monitoring the effect of treatment and communicating relevant information about pain and healing process. In addition, comfort measures should be provided immediately post-episiotomy; the application of crushed ice gel pads is one of these comfort measures (Wickramasinghe *et al*, 2017).

Significance of the study:

Routine episiotomy assisted vaginal delivery in the developing countries including Egypt, is a common practice. The predominance of routine episiotomy is due to obstetricians' belief that it may prevent pelvic floor relaxation and its sequelae, such as urinary incontinence, and facilitate a vaginal delivery. However, studies reported that episiotomy is associated with unnecessary adverse effects as intense perineal pain, delayed wound healing and gapping, episiotomy wound infection, postpartum dyspareunia, fecal and urinary incontinence (Ahmed and Mohamed, 2015; Aradmehr *et al*, 2017).

Episiotomy needs suturing and can result in bleeding, severe pain, wound infection, dyspareunia, and can contribute to a long-term urinary incontinence (Jiang *et al*, 2017). The episiotomy pain interferes with the women ability of nursing and doing their duties as a mother. It may cause mental disorders in mother during postpartum and change her attitude and activities towards her neonate and mother daily living activities) (Mohamed & El-Nagger, 2012). The application of an ice pad for twenty minutes on episiotomy wound of primiparous mothers can be effective in reducing perineal pain and in improving the wound healing (Tournaire & Theau-Yonneau, 2010; Senol & Aslan, 2017; Wilbert, 2017). It is safe, and beneficial to relieve perineal pain (Oliveira *et al*, 2012; Wilbert (2017). Therefore, the present study aimed to evaluate the effect of applying crushed ice gel pads on episiotomy pain and wound healing among postpartum primiparous women.

The aim of the study: The study aimed to evaluate the effect of applying crushed ice gel pads on episiotomy pain and wound healing among postpartum primiparous women.

This can be done through the following:

1. Evaluate the effect of applying crushed ice gel pads on episiotomy pain and wound healing versus routine care among postpartum primiparous women.
2. Investigate the effect of the intervention on postpartum women compliance with daily living activities.

The hypothesis of the study:

H1- Women who applied the crushed ice gel pads will experience a lower level of episiotomy pain than those who do not.

H2- Women who applied the crushed ice gel pads will have better episiotomy wound healing than those who do not.

H3-Women who applied the crushed ice gel pads will have better ability to perform daily living activities.

SUBJECTS AND METHOD

Research design:

A quasi-experimental research design was used in this research.

Setting:

The current study was conducted at the postpartum inpatient ward and the outpatient's clinic at El- Manail maternity Hospital, Egypt.

Sample:

A purposive sample of 200 primiparous women was recruited after their acceptance to participate in the study. They were assigned to two groups (100 for the intervention group and 100 for the control group). Women were enrolled based on the inclusion and exclusion criteria. **The inclusion criteria** included; healthy primiparous women, being 18 to 35 years old, had a full term pregnancy and a normal vaginal delivery with episiotomy, with no labor complications, delivering a single healthy fetus with normal weight and cephalic presentation, and agree to participate in the study. Symptoms of episiotomy infection, labor or postpartum complications were excluded.

The sample size: online sample size calculation was used by the researchers in the current study. Either statisticians or other researchers repeatedly use online advice on sample size calculation. Online sample size calculators have been searched, reviewed and checked for the calculated results based on known formulas for common research objectives (Meysamie *et al.*, 2014). The researchers calculate the number of the target population based on the flow rate of the sample with this specific inclusion and exclusion criteria. It was 480 women per year. The researchers calculate the sample size by using the creative research systems sample size calculator website. <https://www.surveysystem.com/sscalc.htm>. So, the sample size was equal to 214. Nine women dropped out due to losing at the follow-up time while eight women did not follow the instructions were dropped from both groups; the final total sample became 200 postpartum women.

Tools for data collection:

Four tools for data collection were used in the study as the following:

1. **Women interviewing questionnaire:** This tool was developed by the researchers after extensive literature review. It included two sections: 1) **First section:** included the personal data such as (age, educational level, occupation, and residence). 2) The **second section:** included obstetric health-related data such as maternal weight, type of episiotomy, and the number of stitches. In addition, it included neonatal health-related data such as neonate head circumference, gestational age, and weight.
2. **Numeric Rating Scale for pain:** It was adopted from McCaffery & Beebe (1989). It can be used by adults in all patient care settings who are able to use numbers to rate the intensity of their pain. The postnatal women

were asked to place a mark on the line that best indicates the pain they experienced. **Scoring:** the score zero indicates there is no pain and the top score 10 indicates the worst possible pain felt. The first part graded from 1 to 3 which reflects mild pain (nagging, annoying, interfering little with activities of daily livings), the second part graded from 4 to 6 for moderate pain (interferes significantly with ADLs), and the third part graded from 7 to 10 for severe pain (disabling; unable to perform ADLs).

3. **The short-form McGill Pain Questionnaire (SF-MPQ):** The main components of the SF-MPQ consists of 15 descriptors (11 sensory; 4 affective) which are rated on an intensity scale as 0 equal none, 1 equal mild, 2 equal moderate or 3 describe severe. The three pain scores are derived from the sum of the intensity rank values of the words chosen for sensory, affective and total descriptors. The SF-MPQ scores obtained from patients in obstetrical wards (Melzack, 1987).
4. **The Standardized REEDA Scale:** It was adopted from Davidson (1974). It was used to assess postpartum healing of the perineum following an episiotomy repair. It included five signs of Redness, Edema, Ecchymosis, Discharge, and Approximation. Each sign takes a score ranged from 0 to 3 then, the total score of total signs was calculated and categorized as the following; 0 to 2 cm good wound healing, 3 to 5 cm moderate wound healing, 5 to 8 cm mild wound healing, and 8 to 15 cm poor wound healing (Jahdi *et al.*, 2011).

Reliability and validity of the tools:

Tools were submitted to a panel of three experts in the field of Maternity Nursing, Obstetric Medicine and Community Health Nursing to test the content validity. Modifications were carried out according to the panel judgment on the clarity of the sentences and appropriateness of the content. Reliability analysis was conducted to investigate the instrument internal consistency, which used in the study; Cronbach alpha coefficients were calculated to examine the measurement reliability with multipoint items. The accepted values of Cronbach alpha coefficient range from 0.60 to 0.95 (Sun *et al.*, 2007).

Pilot study:

A total of 10% of the sample were included in the pilot study in order to assess the feasibility and clarity of the tools and determine the needed time to answer the questions. Based on its results the changes were carried out. The pilot study revealed the average length of time needed to complete the structured interview schedule. Women included in the pilot study were not involved in the sample.

Fieldwork:

Interviewing and assessment phase: In this phase, data collected to cover a period of 6 months from the beginning of September 2017 to end of February 2018 in the postnatal ward and out patient's clinic from 9 AM to 2 PM, three days per week.

Implementation phase: In this phase, the selected women were assigned into two groups (100 for each). The first selected group was the control group comprised of 100 postnatal. They were encouraged to administer the routine care. They were encouraged to wash hands before and after

each perineal care; remove the soiled pad from front to back and discard in the waste container; dry the perineal area with dry tissue from front to back, and then discard it.

The intervention group used a crushed ice gel pad. It was available in an individual package; each gel pad had an approximately 5 cm width, 23 cm length, and 1.5 cm thickness. The pads were compatible with the anatomical structure of the perineum, no side effect was observed by the participated women after the crushed ice gel pad application.

The researchers provided a clear and concise information through a written pamphlet and oral instructions included the following: 1) Information about the crushed ice gel pad's purpose, benefits, anticipated effects, and how to apply it. 2) Apply the crushed ice gel pad on perineum, after birth by 30 minutes to an hour. 3) Instruct the women to apply the crushed ice gel pad for about 20 minutes then remove it for about 10 minutes before replace it. 4) The perineal pad should be changed regularly to prevent infection. 5) Explanation of the pain scale and self-assessment of the episiotomy by using a mirror to evaluate wound healing at home.

After the first crushed ice gel pad application by two hours, women were asked to indicate the level of episiotomy pain they felt then they assessed for wound condition by REEDA scale.

Evaluation phase:

For both groups, the intensity of perineum pain was evaluated by using the short-form McGill pain questionnaire and the numeric rating scale. Postpartum women were assessed on their episiotomy pain level during the first two hours after birth as a basic assessment, then at first day, after three days and the seven days postpartum. Episiotomy wound healing was evaluated by inspecting the episiotomy site for ecchymosis, tenderness, redness, swelling, purulent discharge or hematomas, and suture approximation of the wound edges using a REEDA scale at first day, after three days and seven days. Daily living activities were evaluated before and after the intervention.

At the first day postpartum, the researchers assessed the women in the obstetric department on their pain level, wound healing and daily activities. After three days, women assessed themselves at home and reported that to the researchers by telephone calls. After seven days postpartum, women were assessed by the researchers during the follow-up time at the obstetric outpatient clinic.

Ethical Considerations:

An official permission was taken from the authoritative personal in the hospital. The researchers introduced themselves to the women who met the inclusion criteria and informed them about the aim of the current study in order to obtain their acceptance to share in this study. Written consent was obtained from them. Confidentiality and anonymity of them were assured through coding the data.

Statistical analysis: Data were coded and transformed into a specially designed format suitable for computer feeding. All entered data were verified for any errors. Data were analyzed using statistical package for social sciences (SPSS)

version 20 windows and were presented in tables and graphs. Frequencies analysis was performed and Chi-square test was used in comparison between two related groups having qualitative data. Also, repeated measures ANOVA, mean and standard deviations were computed. An alpha level of 0.05 was used to assess significant differences.

RESULTS

The study sample included 200 postnatal women from the postpartum ward and out patient's clinic at El- Manail maternity Hospital, Egypt. **Table 1** shows that the mean age of the sample was 26.8 ± 5.8 years old. More than half of them were housewives (54.5%) and were rural dwellers (53.0%). The groups were homogenous as per occupation and residence. There was a similarity between the two groups regarding maternal weight.

Table 2 illustrates that the mean gestational age for the intervention and control group was (38.2 ± 0.6) and (38.8 ± 1.06) respectively. Birth weight of newborns and head circumference were within normal in both groups (2.876 ± 0.5 , 2.799 ± 0.6) and $(31.6 \pm 1.6$, $32.1 \pm 1.7)$ respectively.

Table 3 denotes the characteristics of episiotomy wound for the participants. Majority of the women in the intervention (83.0%) and the control (82.0%) group had a mediolateral episiotomy while less than twenty percent of them (17.0%, 18.0%) had a midline episiotomy. Also, they had about 5 skin stitches on the perineum and the same episiotomy wound length in both groups.

Table 4 compares the sensory, affective, and total pain scale scores for the two groups. The total mean pain score for the first day postpartum was 7.73 ± 1.01 and the mean posttest score was 4.54 ± 1.03 , and then become 0.0(no pain) after one week for the intervention group. However, the total mean pain score for the first day post-delivery in control group was 7.21 ± 1.2 and the mean posttest score was 4.71 ± 0.8 , and 1.85 ± 2.3 for the control group. Added to that, there was a statistically significant difference between the intervention and the control group regarding the total pain scale score during the posttest ($p < 0.001^*$).

Table 5 reveals the changes in mean total REEDA score and categories of episiotomy wound healing for the total sample. The pretest score was 13.37 ± 2.5 for the study group as compared to 13.29 ± 2.6 for the control group. Then the study group REEDA score decreased to 2.72 ± 4.6 and 1.1 ± 3.8 during the posttest. Added to that, most of the intervention group (92.0%) had good episiotomy wound healing while more than half of the control group (57.0%) still has poor and mild healing. There was a statistically significant difference between the study and the control group regarding the total REEDA score and the categories of episiotomy wound healing during the posttest ($p < 0.001^*$).

Figure 1 depicts that the mean REEDA scale score for the intervention group significantly reduced compared to the control group after 3 days and 7 days postpartum.

Table 6 reveals that the majority of the intervention group suffered from severe pain (98.0%), and poor episiotomy wound healing (96.0%) at the first day postnatal. However,

the severity of pain reduced (18.0%, 0.0%) and the wound healing improved during the posttest. The repeated measures ANOVA test indicated a significant difference between the pre “first day”, post 3 days and post 7 days at ($p < 0.001^*$).

Figure 2 illustrates that the mean pain and REEDA scale scores for the intervention group significantly reduced during the 3 days and 7 days postpartum.

Figure 3 demonstrates the changes in the level of dependence in daily living activities for the intervention group. The entire intervention group (100.0%) was dependent on performing the activities of daily living during the first day after delivery. After three days with the intervention, most women (90.0%) improved and became independent. Likewise, afterward seven days they became better and 95.0% of them were independent in daily living activities.

Table 1: Percentage Distribution of the Studied Postpartum Women in Both Groups According to Their Characteristics.

Characteristics	Crushed ice gel pad group (n=100)	Control group (n=100)	Total (n=200)
Age (years old)	25.8 ± 5.8 ^a	27.8 ± 5.7 ^a	26.8 ± 5.8 ^a
Residence:			
o Rural	57.0	49.0	106(53.0)
o Urban	43.0	51.0	94(47.0)
Education :			
o Illiterate	10.0	11.0	21 (10.5)
o Primary education	13.0	31.0	44(22.0)
o Intermediate school.	34.0	23.0	57(28.5)
o Secondary school.	26.0	24.0	50(25.0)
o University	17.0	11.0	28(14.0)
Occupation:			
o House wives	61.0	48.0	109(54.5)
o Working	39.0	52.0	91(45.5)
Maternal weight	84.59 ± 12.3 ^a	85.98 ± 11.8 ^a	

^a= mean ± SD

Table 2: Distribution of neonatal health related data for the studied participants.

Variables	Crushed ice gel pad group (n=100)	Control group (n=100)	p-value
Gestational age	38.2 ± 0.6 ^a	38.8 ± 1.06 ^a	t=4.8* P<0.05
Neonatal birth weight	2.876 ± 0.5 ^a	2.799 ± 0.6 ^a	t=0.8 p>0.05
Neonatal head circumference	31.6 ± 1.6 ^a	32.1 ± 1.7 ^a	t=1.9* P<0.05

^a= mean ± SD *= significant difference

Table 3: Characteristics of episiotomy wound for both groups.

Characteristics of episiotomy wound	Crushed ice gel pad group (n=100)		Control group (n=100)	p-value
- Mediolateral episiotomy	83.0		82.0	$\chi^2 = 0.03$ p> 0.05
- Midline episiotomy	17.0		18.0	
Episiotomy wound length (mm)	4.27	± 0.88 ^a	4.3 ± 0.9 ^a	t = 0.5 p> 0.05
Number of skin stitches on the perineum	4.7	± 1.2 ^a	5.1 ± 1.5 ^a	t = 1.8 p> 0.05

^a= mean ± SD

Table 4: Dimensions of perineal pain experiences scores among the participants.

Dimensions of pain experience	Crushed ice gel pad group (n=100)	Control group (n=100)	P value
Sensory dimension of pain:			
At First day	9.77 ± 4.7	11.8 ± 3.5	t=3.4 p<0.05*
post 3 days	8.65 ± 5.6	11.3 ± 4.02	t=3.9 p<0.001*
post 7 days	6.5 ± 4.3	8.5 ± 3.2	t=3.61 p<0.001*
Affective dimension of pain:			
At First day	0.6 ± 2.1	0.4 ± 4.1	t=0.6 p>0.05
post 3 days	0.6 ± 2.1	0.4 ± 4.1	
post 7 days	0.6 ± 2.1	0.4 ± 4.1	
Total score for NRS of pain:			
At First day	7.73 ± 1.01	7.21 ± 1.2	t=3.1 p<0.05*
post 3 days	4.54 ± 1.03	4.71 ± 0.8	t=1.2 p>0.05
post 7 days	0.0	1.85 ± 2.3	t=7.7 p<0.001*

Table 5: Changes in mean REEDA scale scores and categories of episiotomy wound healing between the participants in both groups.

REEDA Score	Crushed ice gel pad group (n=100)	Control group (n=100)	P value
REEDA score:			
At First day	13.37 ± 2.5 ^a	13.29 ± 2.6 ^a	t=0.2 p>0.05
Post 3 days	2.72 ± 4.6 ^a	10.5 ± 2.14 ^a	t=15.3 p<0.001*
Post 7 days	1.1 ± 3.8 ^a	3.95 ± 4.3 ^a	t=4.8 p<0.001*
REEDA score categories for wound healing (at first day):			
Poor	96.0	97.0	χ ² =0.15 p>0.05
Mild	4.0	3.0	
Moderate	0.0	0.0	
Good	0.0	0.0	
REEDA score categories for wound healing (post 3 days):			
Poor	25.0	97.0	χ ² =115.6 p<0.001*
Mild	0.0	0.0	
Moderate	2.0	3.0	
Good	73.0	0.0	
REEDA score categories for wound healing (post 7 days):			
Poor	7.0	14.0	χ ² =60.2 p<0.001*
Mild	1.0	43.0	
Moderate	0.0	0.0	
Good	92.0	43.0	

^a= mean ± SD

*= significant difference

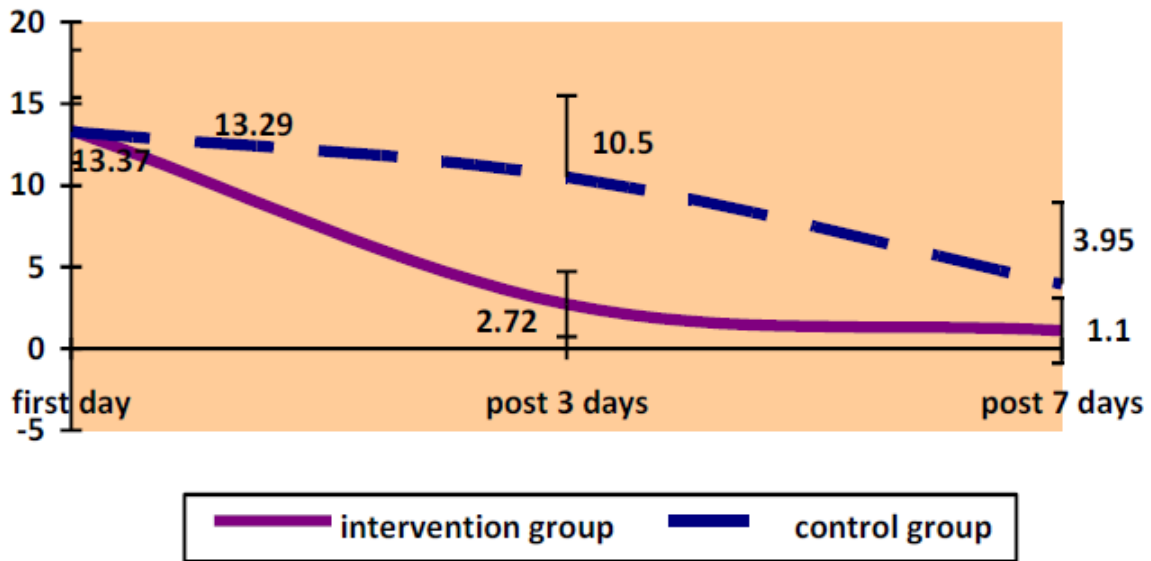


Figure 1: Changes in mean REEDA scale score for the intervention and control group at first day, post 3 days and post 7 days postpartum

Table 6: Changes in mean pain and REEDA scores for the intervention group.

Variables	Intervention group (n=100)		
	At first day	Post 3 days	Post 7 days
Total score for NRS of pain	7.73 ± 1.01 ^a	4.54 ± 1.03 ^a	0.0
Pain degree:			
No pain	0.0	0.0	100.0
Mild	0.0	0.0	0.0
Moderate	2.0	82.0	0.0
Severe	98.0	18.0	0.0
Total REEDA score	13.37 ± 2.5 ^a	2.72 ± 4.6 ^a	1.1 ± 3.8 ^a
	P<0.001*		
REEDA score categories for wound healing:			
Poor	96.0	25.0	7.0
Mild	4.0	0.0	1.0
Moderate	0.0	2.0	0.0
Good	0.0	73.0	92.0

^a= mean ± SD

*= significant difference

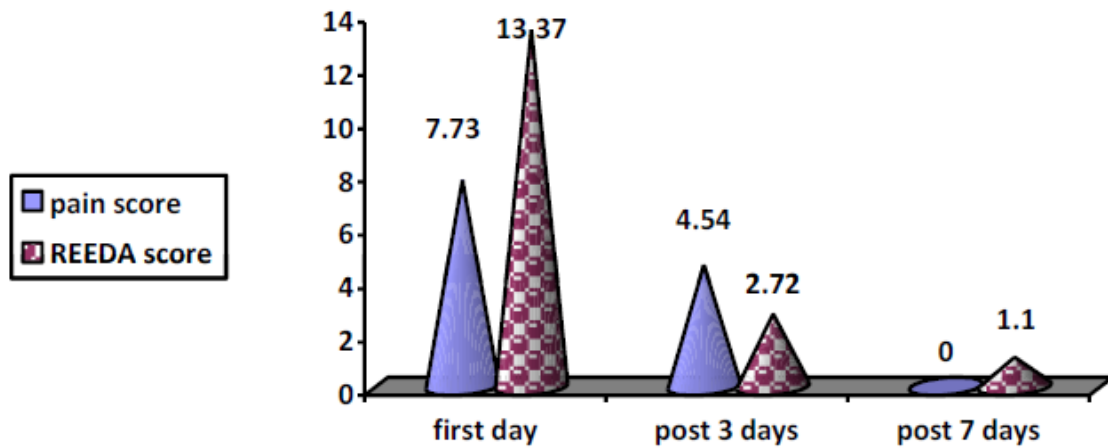


Figure 2: changes in total mean of pain scale and REEDA scale scores for the intervention group

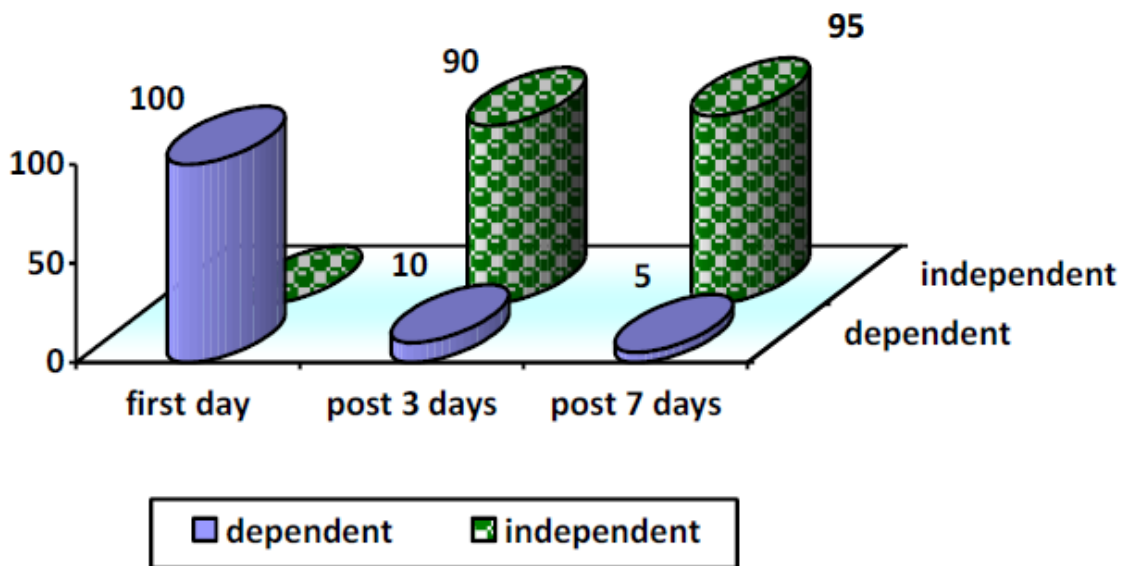


Figure 3: changes in level of dependence in daily living activities for the intervention group

DISCUSSION

The Episiotomy can cause complications after delivery such as blood loss, edema, hematoma, infection, wound dehiscence and perineal pain (Bharathi, Reddy, & Kote, 2013). The application of cold gel pad can reduce the perineal pain. It resulted in statistically significant differences detected in perineal edema, and ecchymosis (Jahdi *et al.*, 2010; Senol & Aslan, 2017). Hence, the current study aimed to evaluate the effect of applying crushed ice gel pads on episiotomy pain and wound healing among postpartum primiparous women, through the following; 1) Evaluate the effect of applying crushed ice gel pads on episiotomy pain and healing process versus routine care among postpartum primiparous women. 2) Investigate the effect of the intervention on postpartum women compliance with daily living activities.

The findings of the current study covered three main areas discussed within the following frame of references: *First*, characteristics of the studied participants. *Second*, the episiotomy pain scale scores; *third*, the effect of crushed ice gel pads on the REEDA scale scores, level of pain, episiotomy wound healing and on the level of dependence in performing the activities of daily living.

Regarding characteristics of the studied participants in both groups; the results of the current study specified that the mean age of the total sample was 26.8 ± 5.8 years old. More than half of them were housewives and were rural dwellers. The groups were similar as per occupation and residence. The mean gestational age was more than thirty-eight weeks of gestation for the intervention and control group. Birth weight of newborns was within normal in both groups. Furthermore, there was a similarity between the two groups regarding maternal weight, neonatal birth weight, and neonatal head circumference. In the same line Kaur, Rana, & Suri, (2013) who studied the effect of dry heat versus moist heat on episiotomy pain and wound healing. They mentioned that in both groups, most of the mothers had gestational age within thirty-six to forty weeks. Birth weight of newborns was within two to three kilograms in both groups. Sameness was seen in terms of obstetric variables related to parity, gravida, a period of gestation, hemoglobin level of mother and a baby birth weight.

According to the literature of different references, an episiotomy can be a mediolateral or midline. The present study represents the characteristics of episiotomy wound for the participants. Majority of the study and the control group had a mediolateral episiotomy. Besides, they had about five

skin stitches on the perineum and about four point three of episiotomy wound length. Correspondingly, a study, which focused on examining the effectiveness of cold gel pad therapy versus infrared light therapy on episiotomy pain and wound healing, reported that most of the participants had a mediolateral episiotomy in both the groups. Majority of them had about five episiotomy stitches in both groups and were gravida one in the first experimental group and gravida two in the second experimental group (Wilbert, 2017).

As regards, the episiotomy pain scale scores; the current study focused on episiotomy pain. It is the most common complaint of postpartum primiparous mothers. The study compares the sensory, affective, and total pain scale scores for the two groups. The total mean pain score on the first day after delivery was seven point seven and the mean posttest score was reduced to four point five, and then they reported no pain for the intervention group. Added to that, there was a statistically significant difference between the intervention and the control group regarding total pain scale scores during the posttest. In harmony, another study done by *Tournaire & Theau-Yonneau, (2010)* who examined the effect of cold therapy on pain in episiotomy wound. The sample was given the cold compress every four hours. They were used the visual analogue scale to measure the pain in episiotomy wound felt by the mothers before starting the study and every four hours after the intervention. Thereafter the findings in the result showed that the application of cold therapy on episiotomy wound for primigravida mothers has significantly lessened the pain sensation. Similarly, the findings of the present study stated a significant reduction in the sensory and total pain scale scores for the intervention group, which indicated the positive effect of crushed ice gel pads on episiotomy pain. It can significantly reduce the perineal pain for postpartum primiparous women.

Throughout another study accomplished by *Jahdi et al., (2011)* a statistically significant decline in pain was reported in the experimental group receiving cold gel pad treatment for twenty minutes at the postpartum fourth hour, 12th hour, and the fifth day related to the control group. Too, the outcomes of the present study come in arrangement with the findings mentioned by *Kaur, Rana, & Suri, (2013)* who discovered a highly significant difference between the groups in terms of pain scores ($p < 0.001$) on day seven and day fourteen for pain scores. Similarly, *Sharma (2010)* and *Chang & Chen (2011)* did a research to test the effect of treatment with cold compress as a remedy to set guide of discomfort of childbirth with episiotomy. The findings of their study indicated that pain was relieved and 'P' value was significant. This comes in agreement with a result of another study which declared that the women in the experimental group reported significantly lower mean pain intensity score, pain interference on daily activities scores at forty-eight hours after delivery, and higher level of satisfaction with pain management at twenty four and forty eight hours post-delivery than the control group after adjusting for demographic and obstetric data (*Lu et al., 2015*). Immediately after applying an ice gel pad to the perineal area, there was a significant reduction in the severity of perineal pain reported, which continued for one hour and up to two hours after the local application (*Paiva et al., 2016*). All of the previously mentioned studies

assured the importance and good effect of cold therapy to reduce the episiotomy pain.

A more recent study stated that, the effect of cold gel pad therapy in experimental group I using pre and posttest scores of numerical pain rating scale. The mean pretest score was more than eight and the mean posttest score was 5.8, and the obtained "t" value was significant (*Wilbert, 2017*). Moreover, *Senol & Aslan, (2017)* in their study stated that the experimental group first visual analog scale score was near to seven; once the cold gel pad application used, the pain levels diminished to about two point six in both primiparous and multiparous mothers. Therefore, the relatively old and recent researches supported our study findings and confirmed the importance of the application of crushed ice gel pads on reducing the episiotomy pain among the studied women.

Regarding, the REEDA scale scores to evaluate the episiotomy wound healing process for the studied participants and the effect of pain and episiotomy wound on the level of dependence:

According to *Jahdi et al.,(2011)* that the use of cold gel pads resulted in statistically significant differences detected in perineal edema, ecchymosis, approximately at five days after episiotomy. In addition, *Copper et al., (2010)* stated that the ice is effective in reducing perineal swelling. It is especially important to apply ice during the first twelve hours after giving birth. Generally, the findings of the present study revealed that majority of the intervention group suffered from poor episiotomy wound healing during the first day postpartum. However, the wound healing improved during the posttest. The repeated measures ANOVA test indicated a significant difference between pre (at first day), post 3 days and post 7 days test and the mean pain and REEDA scale scores for the intervention group significantly reduced. This comes in accordance with *Navvabi Abedian, & Greaves, (2009)* who reported that wound healing rates were better in the cooling gel pad group when compared to the other two groups. Women's views the treatment is effective to alleviate the perineal pain without any adverse effects on wound healing as important aspects of midwifery care (*de Souza Bosco Paiva et al., 2015; Khosla, 2017*). Women were more satisfied when applying cooling gel pads and this treatment appeared to assist in wound healing. Besides, *Mohamed & El-Nagger, (2012)* stated that wound healing systematic assessment of the wound edges using a REEDA scale showed no statistically significant difference in both groups at two hours post-episiotomy repair. However, a highly statistically significant difference between the groups in relation to REEDA scores within twenty-four hours of episiotomy repair.

The finding of the current study clarifies the alterations in the mean total REEDA scores and categories of episiotomy wound healing for the total sample. The pretest score was more than thirteen for the intervention and the control group. Then the study group REEDA score reduced to two point seven and one during the posttest. Added to that, most of the intervention group had good episiotomy wound healing through more than half of the control group still has poor and mild healing. There was a statistically significant

difference between the intervention and the control group regarding the total REEDA score and the categories of episiotomy wound healing during the posttest. In agreement with these results, another study signifies the effect of cold gel pad therapy in experimental group I using pre and posttest scores of REEDA scale. The mean pretest score of REEDA scale was nine point seven, the mean posttest score was seven, and the obtained “t” value was significant (Wilbert, 2017). Consistently, Mahishale, Chougala, & Patted, (2013) stated that after three days of intervention, there was statistically significant difference seen in redness, edema, ecchymosis, and approximation after three days of intervention in the experimental group and there was no difference was seen in the component of discharge between the two groups. This comes in agreement with the results of the current study, which also stated that the mean REEDA scale score for the intervention group significantly reduced compared to the control group after three days and seven days postpartum. These researches, which come in agreement with the current study results, ensure the significance of crushed ice gel pads application on the improvement of episiotomy wound healing.

As regards to the effect of pain and episiotomy wound on the level of maternal dependence in practicing the daily living activities, the current study reported that the entire intervention group was dependent and need help in performing the activities of daily living during the first day after delivery. Subsequently, three days postnatal most of them improved and became independent. Likewise, afterward seven days they became better and ninety-five percent of them were independent in daily living activities. These results come in accordance with Mohamed & El-Nagar, (2012) who mentioned that swelling of the tissues surrounding the bladder and urethra may lead to difficult urination. Fearing the sting of urine on the tender perineal area may have the same effect. Straining with bowel movements will stretch the episiotomy scar and perineum and can cause pain. The interference of acute pain with daily activities has been paid less attention. So, the provision of numerous care measures is intended to facilitate perineal healing, such as cleanliness, ice packs, sitz baths and thorough perineal care. The use of an alternative non-invasive method of pain relief was effective in reducing perineal pain. In the same line Navvabi Rigi *et al.*, (2011) who mentioned that the cooling gel pad is a useful way to relieve perineal pain after episiotomy and reduces the interference of pain with some mental, social and physical activities to reduce the complications of perineum trauma. Furthermore, Senol & Aslan, (2017) denoted that the perineal pain adversely affected postpartum women daily activities such as lying down, sitting, urination, and walking; infant care, and breastfeeding; and comfort levels. Therefore, the crushed ice gel pads are safe and effective to reduce episiotomy pain and improve wound healing for postpartum primiparous women. It can also increase their level of dependence in performing the daily living activities.

CONCLUSION

The study concluded that crushed ice gel pads are safe and effective to reduce pain and improve episiotomy wound healing. Women who applied the crushed ice gel pad at postpartum period experienced a lower level of episiotomy

pain had better episiotomy wound healing and had better ability to perform daily living activities during the posttest than the control group.

RECOMMENDATIONS

On the light of the study findings, it is recommended that:

1. Nurses should be aware of the importance of the use of crushed ice gel pads for postpartum primiparous women to reduce episiotomy pain.
2. Encourage the postnatal women to apply the crushed ice gel pads at the hospital as well as home to improve their episiotomy wound healing and maintain their comfort.
3. Educate the pregnant mothers during antenatal visits about the importance of crushed ice gel pads and how to use after delivery.

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