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Study of Factors Associated with Postoperative Pain Following Episiotomy in Primiparous Women at Mashhad Omalbanin Hospital in 2012

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ABSTRACT

Background & aim: Episiotomy is a common medical procedure for widening the perineum. In fact, perineal pain is the most common complaint after episiotomy. Therefore, it is important to determine factors associated with postoperative pain following episiotomy in order to provide comfort for women after delivery. This study aimed to investigate factors associated with postoperative pain following episiotomy in primiparous women.

Methods: This analytical, descriptive study was conducted on 119 eligible mothers, selected via convenience sampling, referring to Mashhad Omolbanin Hospital. Childbirth-related information was collected using a questionnaire. Neonates and mothers were also evaluated using Redness, Edema, Ecchymosis, Discharge, and Approximation (REEDA) scale and McGill Pain Questionnaire for perineal pain on days 1, 7, 10, and 14 after delivery. Kolmogorov-Smirnov, one-way ANOVA, Spearman's test, and Pearson's correlation were performed, using SPSS version 16. P-value ≤ 0.05 was considered statistically significant.

Results: A significant direct relationship was found between the severity of episiotomy pain on day 7 and length of wound cut (P=0.034), neonatal weight (P=0.040), and number of sutures (P=0.028). There was also a significant relationship between the severity of episiotomy pain on day 10 and the duration of active phase during the second stage of labor (P=0.047), duration of sitting position (P=0.011), and number of sutures (P=0.020). However, a reverse significant correlation was found between the severity of postoperative pain following episiotomy and wound recovery on days 7 (P=0.015) and 10 (P=0.035).

Conclusion: Perineal pain was related to factors such as long perineal cut, slow wound recovery, prolonged active phase in the second stage of labor, neonatal overweight, and mother's prolonged sitting position. Therefore, it is recommended to train health care providers and mothers about these factors.

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Introduction

Episiotomy is a surgical incision in the perineal tissue to enlarge the perineal outlet for delivery (1). The main use of episiotomy is to minimize severe vaginal and perineal injuries (2). Although this procedure is being less applied in developed countries, it is still routinely performed on Asian women, who are predisposed to extensive ruptures, given the short perineum and strict tissues (3).

No precise data exist regarding the prevalence of episiotomy in Iran. However, this rate is estimated to be high since this procedure is routinely performed at hospitals. In this regard, Khajavi (2009) reported that

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about 97.3% of episiotomies in Iran are performed in Tehran (3). Episiotomy in primiparous women was estimated at 88.32% (1769 individuals) at Mashhad Omolbanin Hospital in 2005 (2).

In Khajavi's study, 32.3% and 67.7% of subjects underwent midline and mediolateral episiotomies, respectively, while in a study by Abraham et al., 67% and 33% of subjects underwent midline and mediolateral episiotomies, respectively. As it was revealed, mediolateral episiotomy is applied more frequently in Iran despite the associated complications (3, 5).

Perineal pain is the most common complaint of mothers after episiotomy. Khajavi (2009) reported the frequency of pain on days 1, 10, 40, and 90 after delivery as 96.4%, 63%, 25%, and 12%, respectively (6). Postoperative pain following episiotomy has been always stressful for primiparous women, with negative impacts on their first motherhood experience (7) and mother-child communication (8). This type of pain is one of the most common and influential factors for mothers' function after childbirth, leading to urinary dysfunction, bowel elimination, dyspareunia, and marital problems (9).

Andrews reported the dyspareunia was present in 100% of subjects 10 days after delivery, which reduced to 65.9% on day 40 and 31.2% three months after delivery (10). Short-term perineal pain, accompanied by edema, bruising, stiffness of sutures, infection, wound adhesion, and long-term pain not only has negative impacts on women's function for neonatal care and family responsibilities, but also has significant effects on biopsychosocial aspects of life. Consequently, this pain can lead to anxiety, excitability, furiosity, exhaustion, social isolation, depression, motor disorders, eating and sleep disorders, and problems of neonatal care while sitting, walking, breast feeding, and other activities.

Therefore, perineal pain not only causes physical trauma for mothers, but also results in emotional traumas and influences their quality of life, mental health, and mother-child communication (3, 5, 11-14). Therefore, for the faster recovery of mothers, perineal pain and discomfort should be eliminated (9).

Very few studies have investigated the relationship between the severity of perineal pain and childbirth-related and neonatal factors. In this regard, Khajavi studied the association between the duration of the first stage of labor and neonatal weight (5), Treano evaluated the duration of the second stage of labor (15), and Andrew (10), Carolyn (16), and MoArthur (17) assessed the association between perineal pain, grade of rupture, and perineal injuries.

Several methods are available for perineal pain relief and wound healing after delivery including pharmaceutical and non-pharmaceutical methods such as providing perineal health care and keeping the perineum dry (2). Oral analgesics such as acetaminophen, aspirin, brufen, and diclofenac sodium are among the pharmaceutical agents (18), which impose expenses on health care systems and lead to severe side-effects for the users (19).

It seems that the determination of factors related to postoperative pain following episiotomy is necessary for decreasing mothers' problems after labor, given the high prevalence of episiotomy, perineal pain, and the associated complications. Therefore, this study aimed to investigate factors associated with episiotomy pain in primiparous women in order to provide more efficient health care services for mothers.

Materials and methods

This descriptive, analytical study was conducted on 125 subjects, referring to Mashhad Omolbanin Hospital, who met the inclusion criteria. A pilot study was conducted and the correlation coefficient was calculated as r=0.25. Then, the simple size was determined regarding the correlation coefficient (α=0.05, β=0.2).

The inclusion criteria were as follows: 1) primiparity; 2) age range of 18-35 years; 3) living with the spouse; 4) 38<body mass index (BMI)<30 kg/m^2; 5) cephalic presentation; 6) no symptomatic vaginal/vulvar infections (e.g., infectious discharge, itching, or burning); 7) no clear neonatal malformation or abnormality in neonates; 8) no severe rectocele (grade 2 or higher) or cystocele; 9) no septum or mass; 10) no prior history of gynecological problems; 11) non-use of acetaminophen suppositories over the last 6 hours before labor; and 12) no

repairing surgery on the vagina or perineum.

The exclusion criteria were as follows: 1) disorders during labor progress; 2) prolonged second stage of labor (longer than 2 hours); 3) extended episiotomy and conversion of the wound to a 3rd or 4th grade rupture; 4) ruptures other than episiotomy; 5) abnormal vaginal bleeding; 6) Shoulder dystocia (when maneuvers used to relieve shoulder dystocia except Robert Mac maneuver; 7) manual removal of placenta; 8) hematoma; 9) sexual intercourse by the end of the study (15 days after delivery); 10) curettage or resection within the first 24 hours after delivery; 11) undesired events during the first 14 days after delivery; 12) postpartum fever; 13) infection of the episiotomy area; 14) taking analgesics 4 hours before pain assessment; 15) need for re-suturing in episiotomy after primary repair of episiotomy; and 16) no need for episiotomy.

Six participants were excluded from the study; two of them experienced undesired events, one had a third-grade rupture, and three faced problems during labor progress. Finally, 119 participants were included in the study.

Data were collected using a demographic questionnaire, constipation assessment scale for pregnancy, McGill Pain Questionnaire, Redness, Edema, Ecchymosis, Discharge, and Approximation (REEDA) scale, and examination and recording forms including the form of inclusion/exclusion criteria, demographic data (5 items), labor section (12 items), episiotomy-related factors (13 items), neonatal data (7 items), use of antibiotics and analgesics, and mother's activity level.

The constipation assessment scale evaluated eight characteristics of stool status: abdominal distention or bloating, change in the amount of gas passed rectally, less frequent bowel movements, oozing liquid stool, rectal fullness or pressure, rectal pain with bowel movements, small volume of stool, and inability to pass stool. The score was calculated based on a 5-point scale, ranging between 0 and 4; the final score ranged between 0 and 32. Constipation severity was graded as follows: 0-8 (no problem or mild constipation), 9-16 (relative to moderate constipation), 17-24 (severe constipation), and 25-32 (very severe constipation).

Short-form McGill Pain Questionnaire consisted of three sections; the first section included 15 descriptive words in two main sensitive and emotional categories. The score of each category was graded as follows: no pain=0, mild pain=1, moderate pain=2, and severe pain=3. The second section was the Visual Analogue Scale (VAS), ranging between 0 and 100. Finally, the third section was Present Pain Intensity (PPI), which was graded as follows: no pain=0, mild=1, discomfort=2, torturing=3, terrible=4, and painful=5. The total score was the summed up score of each section.

REEDA scale included 5 variables of redness, edema, ecchymosis, discharge, and approximation of wound edges. Each variable was scored between 0 and 3. The total score was calculated by summing the scores of 5 variables, ranging between 0 and 15; higher scores indicated less wound healing.

Validity of the questionnaires, as well as examination and recording forms was confirmed by content validity. Validity of McGill Pain Assessment was confirmed via criterion validity by making a comparison with VAS (r=0.854). Pazandeh (2008) has also confirmed the validity of REEDA (12).

The reliability of examination and recording forms was also confirmed. Inter-rater reliability was used for confirming the reliability of the exclusion criteria, labor stages, and episiotomy-related form (r=0.87, r=0.94, r=0.89, respectively). The reliability of demographic and pregnancy-related questionnaire was confirmed by test-retest (r=0.89).

The reliability of constipation assessment scale (r=0.82) and REEDA (r=0.89) has been confirmed by Tabatabaee Chehr (2000) (20) and Pazandeh (2008) (12), respectively. The reliability of McGill Pain Assessment tool was also confirmed by Cronbach's alpha (r=0.911).

Firstly, a written permission letter was obtained from the university ethics committee. The objectives of the study were explained to the participants, and informed consents were obtained from women in the active phase of labor, selected via convenience sampling.

At first, the demographic questionnaire and pregnancy-related form were completed. Mothers were transferred to the gynecology department and laid in the lithotomy position as

soon as the active phase of labor started. If episiotomy was required, the midwife cleaned the vulva by Betadine (povidone iodine). As 3-4 cm of the fetal head was seen during contractions, 5 cc of lidocaine 2% was injected between two contractions, while two fingers kept the fetal head. Lidocaine was injected circularly along the cut and 4-5 cm of the perineum was subcutaneously anesthetized by a needle.

During the contractions, a cut was made from the middle of the frouchet for 3-4 cm, with an angle of 45° by a midwife, a midwifery student, or a gynecology resident. Afterwards, the neonate and placenta were delivered. The researcher was present during the first and second stages of labor, and the related data were observed and recorded. After delivery (the onset of the third stage), the researchers recorded the episiotomy-related data such as the length and depth of the cut, using a sterile swab and a graded ruler; the perineum was also observed for extending episiotomy.

The perineum was cleansed again after placing a tampon on the cut; it was important to prevent any contact between Betadine and the cut. For this purpose, 5 cc of lidocaine %2 was injected in the ruptured edges of the lozenge-shaped cut. The cutting area was anesthetized again and repaired by a catgut 0 or 2.0 in the lithotomy position by either a midwife, a midwifery student, or a gynecology resident.

In order to repair the episiotomy cut, suturing was started from 1-2 cm above the episiotomy cut. The vagina was continuously repaired and tied by catgut 0, close to the hymen. Separate sutures were made by catgut 0 in order to repair the perineal muscles; if necessary, muscular layers were separately sutured.

The submucosal layer of the perineum was repaired toward the level of the hymen by continuous sutures and catgut 2.0; the skin was sutured by separate sutures (catgut 2.0). The researcher recorded the number of stitches, the type of thread, and the duration of repair during episiotomy. She also measured and recorded the data related to the third stage of labor, as well as the neonatal data.

After the repair of episiotomy, the researcher instructed the mothers about the required care for perineum and sutures, personal health, and completing the forms (the checklist of taking antibiotics, last dosage of analgesics, and physical activity). An instructive pamphlet was also provided for the mothers.

Episiotomy pain assessment and perineal wound recovery assessment were conducted on the first day of delivery at the hospital and before discharge. Then, the mothers were asked to refer to Mashhad Omolbanin Hospital on days 7, 10, and 14 after delivery for assessing the perineal wound and postoperative pain following episiotomy.

McGill Pain Questionnaire was used for assessing episiotomy pain; this scale was completed by mothers. Also, REEDA scale was applied for the follow-up of episiotomy recovery. The mothers were asked to lie in the lithotomy position, while being examined by REEDA scale; then, the obtained results were recorded. Redness, edema, ecchymosis, and wound edge distance were measured by a graded ruler, and the wound discharge was also observed. Constipation scale was completed by mothers on days 7 and 10. All the participants were given special codes including the number of research unit, date of the follow-ups as a reminder, and the researcher's telephone number.

Mothers were advised to contact the researcher in case they faced any problems. They were asked to hand in the completed forms as they came to the hospital; they could take analgesics, based on the given pamphlet (except 4 hours before referring to the hospital); if necessary, they were contacted on days 6, 9, and 13. If they did not refer to the hospital, the researcher visited the subject's house. Also, if mothers experienced severe pain or showed improper wound healing, they were referred to physicians for diagnosis and treatment.

Spearman and Pearson's correlation tests were performed, using SPSS version 16. P-value < 0.05 was considered statistically significant. In addition, Kolmogorov-Smirnov test was used to evaluate the normality of the data.

Results

The mean age of the participants was 25.27±20.26 years (age range: 18-35 years). The participants' demographic characteristics are demonstrated in Table 1.

Table1. The frequency distribution of demographic data (maternal education and occupation, the spouse's occupational status, and family income) in primiparous women at Mashhad Omolbanin Hospital

Variables		Number (percentage)
Maternal Education	Elementary (5 years)	13(13.3)
	Middle school (8 years)	26(26.5)
	High school (12 years)	46(46.9)
	University (More than 12 years)	13(13.3)
Maternal occupational status	Housewife	96(98.0)
	Employed	2(2.0)
Spouse's occupational status	Unemployed	1(1.0)
	Paid worker	57(57.0)
	Paid student	42(42.0)
	Employee, farmer, military soldier, and car driver	0(0.0)
Family income	Low	23(23.5)
	Sufficient	74(75.5)
	More than sufficient	1(1.1)

Based on the findings, no relationship was found between perineal care on days 1, 7, 10, and 14 after delivery and the participants' demographic characteristics or pregnancy-related data (pregnancy care, wanted/unwanted pregnancy, and Kegel exercise), based on Spearman's correlation coefficient and one-way ANOVA results (P>0.05).

Based on one-way ANOVA, no significant correlation was detected between pain following episiotomy on days 1, 7, 10, and 14 after delivery and some childbirth-related variables such as taking Entonox, problems during labor progress, fetal head position at birth, use of Ritgen's maneuver, and mother's opinion about the severity of labor pain (P>0.05).

Table 2 demonstrates the correlation between other variables and episiotomy-induced pain. There was a direct significant correlation between the duration of the active phase during the second stage of labor and pain following episiotomy on day 10 after delivery (Table 2).

Based on Spearman and Pearson's correlation coefficient tests, no significant relationship was observed between episiotomy-related variables and episiotomy pain on days 1 and 14 (P>0.05). However, there was a significant correlation between pain following episiotomy on day 7, length of cut, and the number of stitches. Also, the number of stitches and episiotomy pain on day 10 were correlated (P<0.05) (Table 3).

Spearman's correlation coefficient and one-way ANOVA tests showed no significant relationship between neonatal variables (e.g., weight, height, head circumference, and gender) and episiotomy pain on days 1, 7, 10, and 14 (P>0.05). However, Pearson's correlation coefficient test showed a direct significant correlation between neonatal weight and the severity of episiotomy pain on day 7 after delivery (P=0.04, r=0.225). Also, based on Spearman's correlation coefficient test, no significant association was found between constipation scale score on days 7 (P=0.09) and 10 (P=0.740) and episiotomy pain on days 1, 7, 10, and 14 after delivery.

Table 2. The correlation coefficient between episiotomy pain on days 1, 7, 10, and 14 after delivery and factors associated with the first and second stages of labor (duration of latent and active phase during the second stage of labor, duration of the third stage of labor, and intensity of hunger and fatigue)

Variables	Mean±Sd	Day 1	Day 7	Day 10	Day 14
Duration of the active phase of the first stage of labor	245.78±72.01	r*=0.068 P=0.089	r=0.071 P=0.172	r=0.064 P=0.094	r=0.079 P=0.164
Duration of the latent phase of the second stage of labor	4.25±3.78	r_s** =0.096 P=0.081	r_s =0.201 P=0.054	r_s =0.190 P=0.058	r_s =0.197 P=0.077
Duration of the active phase of the second stage of labor	9.78±18.84	r=0.158 P=0.054	r=0.166 P=0.065	r=0.199 P=0.047	r=0.170 P=0.074
Duration of the third stage of labor	3.42±7.34	r_s =0.068 P=0.098	r_s =0.040 P=0.364	r_s =0.061 P=0.518	r_s =0.038 P=0.367
Mother's fatigue intensity during the second stage of labor	2.59±3.70	r=0.087 P=0.351	r=0.035 P=0.609	r=0.020 P=0.665	r=0.017 P=0.876
Mother's hunger intensity during the second stage of labor	3.10±3.06	r_s =0.029 P=0.681	r_s =0.033 P=0.651	r_s =0.019 P=0.881	r_s =0.009 P=0.996

* Pearson's correlation
** Spearman's correlation

Table 3. The correlation coefficient between episiotomy-related factors and episiotomy pain on days 1, 7, and 10 after delivery

Variables	Mean ± Sd	Day 7	Day 10
Length of vaginal-mucosal cut cut (mm)	56.73±9.10	r=0.123 P=0.084	r=0.086 P=0.194
Length of perineal cut (mm)	51.85±6.75	r=0.270 P=0.034	P=0.054 r=0.200
Depth of episiotomy cut (mm)	16.97±4.99	r_s =0.200 P=0.054	r_s =0.192 P=0. 601
Number of sutures with catgut 0	11.66±40.52	r_s =0.190 P=0.069	r_s =0.161 P=0.077
Number of sutures with catgut 2.0	11.07±2.19	r=0.156 P=0.074	r=0.131 P=0.081
Number of stitches on the vagina	5.70±1.141	P=0.054 r_s =0.021	r_s =0.157 P=0.061
Number of stitches on the muscles	1. 82±1.37	P=0.520 r=0.065	P=0.621 r=0.050
Number of submucosal stitches on the perineum	5.05±0.96	P=0.064 r=0.170	P=0.073 r=0.098
Number of skin stitches on the perineum	6.08±0.85	P=0.028 r=0.349	P=0.020 r=0.496
Duration of episiotomy repair (min)	19.64±5.42	P=0.609 r=0.052	P=0.803 r=0.012
Lidocaine dosage used prior to episiotomy (ml)	4.380±0.487	P=0.481 r=-0.076	P=0.364 r=0.048
Lidocaine dosage used prior to the repair of episiotomy (ml)	4.510±0.822	P=0.734 r=-0.067	P=0.994 r=0.011
The interval between the injections of lidocaine and the cut (s)	61.110±42.421	P=0.975 r_s =-0.014	P= 0.913 r_s =0.021

Moreover, based on Pearson and Spearman's correlation tests, no significant relationship was found between pain severity on days 1, 7, 10, and 14 after delivery and the duration of walking, lying, sitting, and squatting during defecation, cross-leg sitting, or activities applying strain and tension on stitches during the first 10 days after delivery. Similarly, based on Pearson's and Spearman's correlation tests, no significant association was found between the number of stairs climbed on the first 10 days after delivery and the severity of episiotomy

Table 4. Regression test results regarding the association between episiotomy pain on days 7 and 10 after delivery and delivery-related information, neonatal data, and mothers' activity level (with P<0.15)

Variables	Day 1	Day 7	Day 10	Day 14
Duration of the active phase of the first stage of labor	β=0.010 P=0.100		β=0.001, P=0.19	
Duration of the latent phase of the second stage of labor	β=0.036 P=0.092	β=0.050 P=0.061	β=0.064 P=0.059	β=0.013 P=0.080
Duration of the active phase of the second stage of labor	β=0.021 P=0.071	β=0.038 P=0.069	β=0.058 P=0.060	β=0.020 P=0.077
Duration of the third stage of labor	β=0.009 P=0.101			
Length of vaginal-mucosal cut		β=0.036 P=0.092		
Length of perineal cut	β=0.031 P=0.098	β=0.152 P=0.020	β=0.081 P=0.055	β=0.059 P=0.068
Depth of episiotomy cut		β=0.024 P=0.096		
Number of sutures with catgut 0		β=0.048 P=0.061	β=0.021 P=0.078	
Number of sutures with catgut 2.0		β=0.022 P=0.083	β=0.015 P=0.093	
Number of stitches on the vagina	β=0.006 P=0.198	β=0.045 P=0.063	β=0.035 P=0.068	
Number of submucosal stitches on the perineum		β=0.022 P=0.074	β=0.032 P=0.069	
Number of skin stitches on the perineum	β=0.084 P=0.051	β=0.252 P=0.011	β=0.302 P=0.001	β=0.088 P=0.053
Neonatal weight	β=0.043 P=0.071	β=0.048 P=0.070		
Sitting duration	β=0.078 P=0.057	β=0.087 P=0.054	β=0.116 P=0.027	β=0.069 P=0.062

pain on days 1, 7,10, and 14 after delivery.

Spearman's test showed a significant direct correlation between the duration of sitting and severity of episiotomy pain on day 10 after delivery (P=0.011, r=0.651). Spearman's correlation coefficient test also showed a reverse significant correlation between episiotomy pain and wound recovery on days 7 (P=0.015) and 10 (P=0.035) after delivery (Table 3).

Regression test was performed on the related variables with P< 0.15. Among these variables, episiotomy pain 7 days after delivery was correlated with the number of skin stitches on the perineum and the length of perineal cut. Pain after 10 days was also associated with the number of skin stitches on the perineum and sitting duration (Table 4).

Discussion

The prevalence of mediolateral episiotomy in Iranian community is higher than the global mean, despite the associated complications. Therefore, the prevalence of complications such as perineal pain and dyspareunia is higher in our country (5). In the present study, 98% of participants experienced perineal pain within the first 24 hours after delivery.

Based on McGill pain assessment tool, the subjects' scores ranged between 5 and 49. This finding was similar to the results by McArthur (17) and Khajavi (5). McArthur reported perineal pain in 97% of the subjects within the first 24 hours after delivery at the University of Toronto (17). As to the findings, there was a direct significant relationship between the active phase of the second stage of labor and episiotomy pain on day 10 after delivery; this finding could be related to uterine contractions and consequently lasting strain on the muscles of the pelvic floor.

Thranovetal (1990) also stated that prolonged second stage of labor led to more severe pain following episiotomy due to the increased pressure on the perineum (15). Khajavi also showed a correlation between the severity of pain on day 40 after delivery and the duration of the first stage of labor (5).

The present study showed a direct significant relationship between the length of cut and episiotomy pain on day 7 after delivery. Episiotomy pain on days 7 (0.15%) and 10 (0.08%) after delivery was related to the length of perineal cut. In fact, the area of the wound affects wound recovery, and larger wounds recover later (12, 21, 22); therefore, pain may be increased due to delayed wound healing, considering the length of the cut.

All pain receptors in skin and other tissues are free nervous terminates which extend in the superficial layers of the skin, periosteum, joints, and muscles. Pain receptors are activated by mechanical, chemical, and thermal stimulators. Tissue injury causes the release of prostaglandin, bradykinin, serotonin, P material, and histamine, which activate or sensitize pain receptors (23). In the present study, it seemed that longer tissue injuries (longer cuts) could increase the pain due to activating or sensitizing more pain receptors.

In two prospective studies by Vasanth Andrews and Klein, women who needed more analgesics on days 1, 5, 7, and 10 after delivery, had second, third, and fourth grade ruptures, unlike women with intact perineum or first grade ruptures; these women also experienced more severe pain during resting, sitting, and performing other activities (10-24).

McArthur showed that the increased grade of perineal rupture led to more severe perineal pain on day 7 after delivery. The frequency of perineal pain in women with intact perineum was 38%, while first and second grade ruptures were reported in 60% of cases and third and fourth grade ruptures were seen in 91% of subjects (17). In a study by Carolyn, a significant relationship was found between the rupture grade (or perineal injury) and pain; in fact, perineal injury could predict pain score after delivery (16).

The findings of the abovementioned studies are not in agreement with the present results. In the current study, no significant relationship was found between the depth of episiotomy cut and episiotomy pain on days 1, 7, 10, and 14 after delivery. There was a significant direct relationship between the number of skin stitches and episiotomy pain on days 7 and 10 after delivery; in fact, the lower number of skin stitches was correlated with less pain. In the evaluation of episiotomy, pain was reported as 0.08% on day 1, 0.25% on day 7, 0.30% on day 10, and 0.08 % on day 14 after delivery; the

pain was correlated with the number of skin sutures.

As previous studies have indicated, no suture can lead to reduced pain or dyspareunia in the first 3 months after delivery (25, 26). In fact, if tissues approximate properly, suturing is not required; also, continuous subcutaneous suturing is preferred to separate skin sutures (1).

Another finding of the present study was the direct relationship between the weight of neonates and episiotomy pain on day 7 after delivery. In the present study, episiotomy pain was reported as 0.04% on days 1 and 7 after delivery, and the pain was correlated with neonatal weight, based on regression test results; this relation could be due to the higher pressure of heavier fetuses on the perineum. This finding is supported by previous reports, i.e., perineal pain could be related to either significant pressure on the perineum because of heavy neonates or prolonged second stage of delivery (5).

As Attarha (2008) indicated, the most important predictive factors for perineal injury were primiparity and macrosomia (27). May and Malimester also stated that the weight of neonates plays an important role in discomfort and pain after episiorrhaphy due to the increased pressure on the perineum (28). Also, Khajavi (2010) found a relationship between the severity of pain and neonatal weight on days 1, 10, and 40 after delivery (5).

In the present study, there was a significant direct relationship between episiotomy pain on day 10 and duration of sitting. In fact, episiotomy pain was reported as 0.07% on day 1, 0.8% on day 7, 0.11% on day 10, and 0.06% on day 14 after delivery; the pain was correlated with the duration of sitting.

One of the complications associated with wound recovery is tissue detachment after wound closure due to sudden severe strain or pressure on wound as a result of coughing or severe/continuous vomiting. In the proliferative phase of wound healing, one of the most important care strategies is to prevent strain on the suture line (21, 29), since the sudden stretching of the suture line inhibits the formation of collagen networks and connective tissues (22, 25); therefore, prolonged sitting could lead to increased perineal pain by either pressure on sutures or delayed wound healing.

According to the present study, there was a significant reverse relationship between the severity of pain and the recovery rate of episiotomy wound. Pain stimulates the sympathetic system and vasoconstriction, accordingly (24). Oxygen is necessary for a successful inflammation process, vascularization and angiogenesis, epithelialization, formation of contextual tissues, and fibroblastic activities (25, 30). Therefore, it seems that pain may delay wound healing via vasoconstriction (5). On the other hand, delayed healing could increase pain duration (2). The sympathetic activity could be stopped by fluid replacement, pain relief, and hypothermia prevention for accelerating wound healing (30).

The simultaneous study of the relationship between several childbirth-related factors, episiotomy, and neonatal factors could be mentioned as the strength of the present study; in fact, no previous study has separately examined these factors.

In this study, care provision for first, second, and third stages of labor, delivery of placenta and neonate, and episiorhaphy could not be conducted by one single person due to the study environment. We tried to control the confounding factors by evaluating some episiotomy- and delivery-related variables such as the duration of the second stage of delivery (longer than 2 hours), longitudinal extension of the cut and its conversion to third or fourth grade rupture, presence of any ruptures except episiotomy, manual delivery of the placenta, and use of povidone iodine in episiotomy.

The current findings could be used as a basis for future studies to relieve episiotomy pain; it could be also helpful for future educational programs for instructors, students, and mothers. Mothers should be trained about shorter sitting periods, and midwives should be instructed about the importance of close pregnancy monitoring (to prevent macrosomia), making short episiotomy cuts, episiorrhaphy with minimum skin sutures, and the management of the second stage of labor. It is also recommended to assess postoperative pain following episiotomy after providing patients with the required instructions.

Conclusion

According to the obtained results, perineal pain may be increased by longer cuts, slower wound healing, and more pressure on the perineum (due to prolonged second stage of labor, macrosomia, and prolonged sitting); therefore, both technique and quality of care are of high significance. It is recommended to inform health care providers and mothers about the importance of these factors.

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Reference

1. Myles M, Ruth B, Linda B. Myles text book for midwives.16 th ed. London: Churchill Livingstone; 2010: 458-63.
2. Golozar S, Abbaspour z, Namjouian F, Mahmoud Latifi S, Mirahi A. [Evaluating the effect of oral bromelain (pineapple) on episiotomy wound healing in primiparus women]. Feyz, Kashan University of Medical Sciences & Health Services. 2011; 15(2): 84-90.[Persian]
3. Jahdi F, Kheyrkhah M, Haghani H, Taghizadeh M, Mehrabi E, Eghdampour F. The effect of Aloe Vera ointment on the intensity of perineal pain following episiotomy: A randomized blind clinical trial. Asrar, Journal of Sabzevar School of Medical Sciences. 2011; 18(4): 243 –249. [Persian]
4. Navabi Rigi SH, Abedian Z, Poorjavad M, Smaeli H. Comparing the effect of cooling jell pads and ice pack, after episiotomy on the intensity of perineal pain. Tabibe Shargh. 2007; 9(1): 27-36. [Persian]
5. Khajavi Shojae K, Dawati A, Zayeri F. Persistent perineal pain after episiotomy in nulliparous women admitted to hospitals in Tehran. Journal of Medical Sciences Ghom 2010; 3(2):57-62. [Persian]
6. Khajavi Shojae K, Dawati A, Zayeri F. Frequency and Side Effect of Episiotomy in Primiparous Women. Journal of Medical Sciences Ghom. 2010; 3(2):2- 4. [Persian]
7. Jahdy F, Eghdampour F, Kheyrkhah M, Naghizadeh SH, Haqani H, Taghizadeh M, et al. The Impact of Aloe vera and Calendula on Perineal Healing after Episiotomy in Primiparous Women: A Randomized Clinical Trial. Journal of Caring Sciences. 2013; 2(4):279-286.
8. Albers LL, Sedler KD, Bedrick EJ, Teaf D, Peralta P. Midwifery care measures in the second stage of labor and reduction of genital tract trauma at birth. Journal of Midwifery & Women's Health. 2005; 50(5): 365-372.
9. Macarthur A, Imarengiaye C, Tureanu L, Downey K. A randomized, double-blind, placebo-controlled trial of epidural morphine analgesia after vaginal delivery. Epidural morphine analgesia after vaginal delivery. Anesthesia & Analgesia. 2010; 110(1):159-164.
10. Andrews V, Thakar R, Sultan AH, Jones PW. Evaluation of Postpartum Perineal Pain and Dyspareunia: A Prospective Study. European Journal of Obstetrics & Gynecology and Reproductive Biology. 2008; 137(2):152-156.
11. Jammes DC, Simpson KP, Creehan PA. Perinatal Nursing. 2th ed. Philadelphia: Lippincott; 2001: 454.
12. Pazandeh F, Savadzadeh SH, Faraz Mojab H, Alavi Majd H. Effects of Chamomile Essence on Episiotomy Healing in Primiparous Women. Journal of Ardabil University of Medical Sciences (Jaums). 2009; 8(4):364-370. [Persian]
13. Vakilian K, Attarha M, Bekhrady R, Ghebleh F, Hatami Z, Siraj A. Impact of Lavender essential oil (lavender) in episiotomy wound care after delivery. Journal of Shahrekord University of Medical Sciences. 2009; 10(3)63-69.
14. Golozar S, Abbaspour Z, Namjouian F, Latifi SM, Mirahi A. Evaluating the effect of oral bromelain (pineapple) on episiotomy wound healing in primiparus women. Feyz, Journal of Kashan University of Medical Sciences. 2011; 15(2):84-90. [Persian]
15. Thranov I, Kringelbach AM, Melchior E, Olsen O, Damsgaard MT. Postpartum Symptoms Episiotomy or Tear at Vaginal Delivery. Acta Obstetricia et Gynecologica Scandinavica. 1990; 69 (1): 11-15.
16. Sampselle CM, Hines S. Spontaneous Pushing During Birth Relationship to Perineal Outcomes. Journal of Nurse-Midwifery 1999; 44(1): 36-39.
17. Macarthur AJ, Macarthur C. Incidence, severity, and determinants of perineal pain after vaginal delivery. American Journal of Obstetrics and Gynecology. 2004; 191:1199–1204.
18. Minassian VA, Jazayeri A, Prien SD, Timmons RL, Stumbo K. Randomized trial of lidocaine ointment versus placebo for the treatment of postpartum perineal pain. Obstetrics & Gynecology. 2002; 100(6): 1239-1243.
19. East CE, Begg L, Henshal NE, Marchant P, Wallace K. Local cooling for relieving pain from perineal

trauma sustained during childbirth. Cochrane Database System Review. 2007; 4: 63-67.
20. Tabatabae chehr M. Comparison of the incidence and severity of common gastrointestinal complaints housewives and employed women Referred prenatal care city Bojnoord. Master's Thesis. School of Nursing and Midwifery Mashhad University of Medical Sciences, Iran; 2001. [Persian]
21. Taylor C, Laylsyn C. Taylor's Nursing Fundamentals of Nursing Concepts. Translator : Eftekharimanesh A, Larijani F. 2th ed. Tehran: Boshri; 2010:230-236,316. [Persian]
22. Estaj Z, Toufeghean T, najjar L. Techniques and Principles of care: According to the latest headlines course of care principles and techniques of the Supreme Council for Planning Emergency Medical Course. 1 th ed. Tehran: Andesheh Rafeei; 2008:75,76. [Persian]
23. Nsevn Pour SH. Pain. 1th ed. Tehran: Teaymorzadeh; 2001:68-70. [Persian]
24. Klein MC, Gauthier RJ, Robbins JM. Relationship of episiotomy to perineal trauma and morbidity, sexual dysfunction, and pelvic floor relaxation. American Journal of Obstetrics and gynecology. 1994; 171(3):591–598.
25. Johnson R, Taylor W. Clinical Midwifery Skills. Translators: Shamaeyan N, Hadizadeh F, Ferozi M. 1th ed. Mashhad: Gonabad University Press in collaboration with Sokhan Gostar; 2007:296-300,297,301-302. [Persian]
26. Vincenzo B. Obsretric Evidence Based Guidelines. 1th ed. United Kingdom: Informa Healthcare; 2007:64.
27. Attarha M, Akbari Torkestani N, Heydari T, BBayatian Y. Effect of Perineal Massage During Second Phase of Labor on Episiotomy and Laceration Rates Among Nulliparous Women. Hayat. 2009; 15(2):15-22. [Persian]
28. May KA. Comprehensive maternity nursing. Philadelphia: Lippincott co; 1996:864.
29. Nobahar M. Techniques and Principles of care: According to the latest headlines course of care principles and techniques of the Supreme Council for Planning Emergency Medical Course. 2th ed. Tehran: Boshri; 2009:192. [Persian]
30. Malek Ataei M, Faredean D, Farhang SH. Karent Diagnostic and threatment surgical. 1th ed. Tehran: Nasl Farda; 2003:95-110. [Persian]