

## Effectiveness of Betadine versus Normal Saline Dressing on Episiotomy Wound Healing

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### Abstract

**Background:** Non-Hodgkin's The current study **aims** to study the effectiveness of Betadine versus Normal saline dressing on episiotomy wound healing. A **quasi experimental** study included a Simple random sample of 160 postnatal women (80 mothers used saline dressing and 80 mothers used povid one iodine solution (10%) who had normal vaginal delivery with episiotomy from Ain Shams University Maternity Hospital). Three **tools** were used for data collection; **I.** Structured-interviewing questionnaire sheet, **II.** Standardized REEDA scale and **III.** Visual Analogue Scale. The **results** revealed that normal saline had a positive effect on the healing of episiotomy wound among postnatal mothers in form of lower REEDA scale score and pain scores (VAS). The study **recommended** that; educational session to increase women awareness about use of normal saline after episiotomy in form of leaflet or counseling session should be adopted. There should be integration of the saline dressing as a main part in discharge plan. Further researches to replicate the study on large sample to determine the factors affecting episiotomy wound healing should be applied.

**Key words:** Episiotomy, saline dressing, povidone iodine solution, postnatal.

### Introduction

Episiotomy sutures can cause considerable discomfort and pain for postpartum women because the perineum is vascular and an extremely tender area and the muscles of the perineum is involved in many ordinary activities such as sitting, walking, standing, squatting, urinating, defecating etc. **Pillitteri A (2013)** Presence of pain entails difficulties to practice motherhood and perform daily activities such as self-care, breastfeeding and newborn care. Recent studies have evidenced that it is cause for pain, which then interferes with physical

and mental wellbeing, as well as with social activities. **Chang et al.,(2011).**

The typical healing time for an episiotomy is around 4 to 6 weeks depending on the size of incision and the type of suture material used to close the wound. **Lynda (2009)** The delay in perineal healing leads to increasing the complications such as bleeding, pain, discomfort, dyspareunia and anxiety. Although these problems are not acute or life-threatening, their potential impact on daily function of mother is important. Infection of episiotomy wound can lead the Puerperal sepsis. Puerperal sepsis is one of the major causes of maternal

morbidity and mortality. **Fraser & Cooper (2014)**

Normal saline is easily available, efficient, and cost effective. It is most commonly used solution due to safety (lowest toxicity) and physiologic factors. Also, the application of normal saline is useful in the first 24 hours post-partum which reduces inflammatory reaction and oedema. It will not cause any burning pain and does not cause damage to the new tissues and thus promote the healing process. **Malini . R.(2012).**

Povidone iodine (Betadine) is a simple and inexpensive antiseptic solution consisting of polyvinyl pyrrolidone with water, iodide and 1% available iodine; it has bactericidal ability against a large array of pathogens **Jayaraja et al., (2009)**. Povidone iodine appears to be active against all microorganisms including Gram-positive and Gram-negative bacteria, spores, cysts, mycobacteria, fungi, viruses and protozoa. Dilution of 10% povidone-iodine solution of up to 1:100 has demonstrated more rapid killing of *Staphylococcus aureus* and *Mycobacteria chelonae* than the undiluted solution. The mechanism for this effect of increased antibacterial activity at lower concentration is thought to be due to weakening of the bonds between the povidone molecule and the iodine, leading to a higher level of free iodine. **Ferguson et al., (2009).**

The nurse has an important role in taking care of the postnatal mothers with episiotomy. It is essential to utilize an appropriate method for management of the perineal suture to reduce the perineal discomfort, hasten the healing of episiotomy wound and to protect the stitches against infection and hematoma because the episiotomy incision site is located where there is a high possibility

of contamination with vagina and rectal bacteria. **Murray et al., (2012).**

### **Justification of the Problem**

Episiotomy constitutes most common obstetrical procedures among postnatal women with the vaginal delivery. It has a highly prevalence rate worldwide, According to WHO the incidence rate of episiotomy approximately 30-90% worldwide of women with the vaginal delivery had episiotomy **Hofmeyr et al.,(2011)**. Women with Episiotomy experience group of physical, psychological and social problems that diminish their quality of life, which reflect negatively on women's family. Nursing intervention for episiotomy wound is essential to prevent the medical co-morbidities associated with episiotomy. Cost of medical treatment is a major issue influencing the patient and her treatment. Use of normal saline would be cost effective as the healing occurs without local antibiotics or disinfectants. So, this study needs to assess the effectiveness of saline dressing on episiotomy wound healing.

### **Aim of the Study**

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This Study aimed to evaluate the effectiveness of Betadine versus Normal saline dressing on episiotomy wound healing.

### **Research Hypothesis**

Saline dressing will improve episiotomy wound healing more than Betadine.

### **Subjects and Methods**

#### **Research design**

A quasi experimental study was utilized to accomplish this study.

### Setting

It was conducted at postnatal "recovery room" at labor unit at Ain Shams Maternity University Hospital.

### Subjects

A Simple random sampling of 160 postnatal women (women according to the following inclusion criteria: postnatal women who had normal vaginal delivery with episiotomy, postnatal women who were free from medical disorder that could delay healing process as DM, obesity...etc.) were involved in the study divided into two equal groups (Normal saline and betadine).

**Sample:** was calculated according to formula statistics

$$n = \frac{(Z_{1-\alpha/2} + Z_{1-\beta})^2 [P_1(1-P_1) + P_2(1-P_2)]}{(P_1 - P_2)^2}$$

- Z1: statistic for a level of confidence. (For the level of confidence of 95%, which is conventional, Z value is 1.96).
- P1: expected prevalence or proportion in intervention group. (P is considered 0.5)
- P2: expected prevalence or proportion in control group. (P is considered 0.5)
- $\alpha$ : Error type 1 (is considered 0.05)
- $\beta$ : Error type 2 (is considered 0.10)

### Tools and technique of data collection

Three tools of data collection were used to achieve the aim of the study as follows:

#### 1. Basic data assessment tool "Structured interviewing questionnaire sheet"

It was designed by the researcher after review of the related literature. It consisted of 10 questions (closed questions) divided into two parts:

- **Part I:** Personal data (demographic data) (questions 1-5). This part aimed to collect data related to age, marital status, educational level, occupation and income.
- **Part II:** Present obstetric history (questions 6-10)

This part aimed to collect data related to number of pregnancies & previous labor, the last date of labor, number of children and type of episiotomy.

#### 2. Episiotomy wound healing assessment tool "Standardized REEDA scale adopted from Jahdi et al (2011).

This tool was used to assess the level of healing of episiotomy wound before and after intervention. REEDA Scale is as a descriptive scale that has a four-point categorical scores (0-3) which measures five components associated with the healing process. These components are Redness, Edema, Ecchymosis, Discharge, and Approximation.

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REEDA scale Cronbach's alpha coefficient was 0.82.

| Points   | Redness                                   | Edema                           | Ecchymosis   | Discharge        | Approximation                                    |
|----------|---|---------------------------------|--|------------------|--|
| <b>0</b> | <b>None</b>                               | <b>None</b>                     | <b>None</b>  | <b>None</b>      | <b>Closed</b>                                    |
| 1        | Within 0.25 cm of incision<br>Bilaterally | Less than 1 cm from incision    | Within 0.25 cm bilaterally or 0.5 cm Unilaterally  | Serum            | Skin separation 3 mm or less                     |
| 2        | Beyond 0.5 cm of incision<br>Bilaterally  | 1-2 cm from incision            | 0.25-1cm bilaterally or 0.5-2cm unilaterally       | Serosanguineous  | Skin and subcuta-neous fat separation            |
| 3        | Beyond 0.5 cm of incision<br>Bilaterally  | Greater than 2 cm from incision | Greater than 1 cm bilaterally or 2 cm unilaterally | Bloody, purulent | Skin and subcutaneous fat and fascial separation |
| Total    |   |                                 |  |                  |  |

➤ **Scoring system**

Each item is rated on a scale of 0 to 3 and total scores ranged from 0 to 15. The lesser score indicates better healing.

### 3. The Visual Analogue Scale (VAS) for assessing level of pain adopted from Li et al (2007).

This tool was used to assess the level of pain. It is a subjective measure of pain. It consisted of a 10cm line with two end points representing 'no pain' on the left side and 'worst pain' on the right side. The women were asked to rate their pain by placing a mark on the line corresponding to their Current level of pain.

VAS scale Cronbach's alpha coefficient was 0.86.

➤ **Scoring system**

Score 0 (No pain), 1-3 (Mild pain), 4-7(Moderate pain), and 8-10 (worst pain).

**Pilot study:**

Pilot study involved 16(10% of the sample) women attending the postnatal "recovery room" at labor unit of Ain Shams University Maternity Hospital (of total sample included in the study). The pilot was done to evaluate the relevance, clarity and content validity of the tools used for data collection, evaluate time needed for application of the study and find the possible obstacles and problems that might face researcher and interfere with data collection process. Women included in the pilot study were excluding from the total sample.

**Field work description (procedure):**

**Field Work:**

includes interviewing, assessment, implementation and evaluation.

**Interviewing**

1. The data was collected from August, 2014 to June, 2015.

2. The researcher attended the previously mention setting 3 days a week from 9 am to 2 p.m.
  - Clean the episiotomy wound from forchette to anus and repeat this procedure for three times with different clean cotton.
3. The researcher selected women according to the previously mentioned criteria.
  - Wipe it with dry cotton making it clean and dry.
4. The researcher conducted the first interview with women in both groups to fill the data in the tool before discharge from hospital in postnatal "recovery room" at labor unit. Then the researcher provided women with the required instructions regarding dosage, technique and frequency of saline dressing & routine care solution which were clearly mentioned later.
  - Instruct the women to repeat the procedure twice a day for 10 days at 8 hours of interval.

#### **For control group routine care**

For the control group instruct the women to apply povidone iodine solution (10%), three tablespoons in four glasses of water three times a day.

#### **Evaluation**

The researcher conducted the follow up visits on the 3<sup>rd</sup>, 7<sup>th</sup>, and 10<sup>th</sup> days at postpartum period to assess the effect of saline dressing on postnatal mothers' episiotomy wound healing process by REEDA scale for both group (normal saline solution and betadine). Also, Visual Analogue Scale was used to asses level of pain in both groups.

#### **Assessment**

1. The researcher conducted initial assessment in hospital for both group before discharge to assess episiotomy wound condition using REEDA scale and Visual Analogue Scale.

#### **Implementation**

For intervention group normal saline

- Instruct the women to put on their side with upper buttock raised or placed in the lithotomy position and a good light source is essential for visualization of episiotomy wound.
- Instruct the women to put the normal saline solution in a bowl, and pour some of it over the women perineal area.
- Take a clean cotton roll and dip it into the solution and squeeze it properly.

#### **Content Validity:**

The developed tools were reviewed for the appropriateness of items and measuring the concepts through an three experts jury panel of Maternity and Gynecological Nursing ,faculty of nursing , Ain Shams University to assure content and face validity of the questionnaire then accordingly some questions were modified and other scan celled.

### **Ethical considerations:**

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The following research ethics was considered and maintained during the study:

Oral informed consent was obtained from participant after explaining the purposes of the study, no harm occurred to participant, each participant had right to withdraw from the study at any time, women rights was kept, data was confidential and used by researcher only. The proposal reviewed and approved by the faculty ethics committee.

An official approval letter clarifying the title, purpose and setting of the study was obtained from the Director of the Faculty of Nursing at Ain Shams University and Director of Ain Shams Maternity University Hospital as an approval for data collection to conduct this study.

### **Limitation of the study:**

The sensitivity of data collection as REEDA Scale items and care leads to women's embarrassment.

### **Statistical Design**

The collected data were organized; cauterized, analyzed using the statistical package for social studies (SPSS) version 18.0. Quality control was done at the stages of coding and data entry. Data were presented using descriptive statistics in the form of frequencies and percentages for qualitative variables and means and standard deviations for qualitative variables. Qualitative variables were compared using chi-square test. Statistical significance was considered at P- value < 0.05, highly significant difference obtained at  $p < 0.001$ .

### **Result**

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**Table(1):** illustrated the demographic characteristics of the control group, the mean age of the mothers was  $22.00 \pm 4.91$ . Concerning the marital status, 100% were married women. Regarding to the educational level as explained in **figure 1**; the results shows that 39.4% & 35.2% of the control group was Intermediate, Primary education respectively. Regarding to the occupation status the result shows that 97.2% of the studied sample were housewives. In addition, 49.3% of the control group had not enough income.

**Table (2):** showed that the demographic characteristics of the study group, the mean age of the mothers was  $20.68 \pm 2.34$ . Concerning the marital status; of the study sample, 100% of them were married. Regarding the educational level as explained in **figure 2**, the results shows that 34.3% & 31.3% of the study group was high, primary education respectively. Regarding the occupation status, the result shows that 95.5% were housewives in the study group. In addition, 56.7% of study group had enough income.

**Table (3):** showed that obstetric history of the control group, represented that 77.4% of the control group were primigravida. 22.5% of the control group was multigravida, and 87.5% of them the previous labor was since 1-2 years. On the other hand, the results represent that 88.7% of the control group their type of episiotomy was Medio-lateral.

**Table (4):** illustrated that the obstetric history of the study group, represented that 71.6% of the study group was primigravida, and 28.4% of them the previous labor was since 1-2 years. On the other hand, the results

represent that 94% of the study group their type of episiotomy was Medio-lateral.

**Table (5):** showed that the comparison of (REEDA parameters) episiotomy healing process in the two groups before intervention the results shows that there were no statistically significant difference between both groups (control and study) in relation to redness, edema, ecchymosis, discharge and suture approximation at before the intervention.

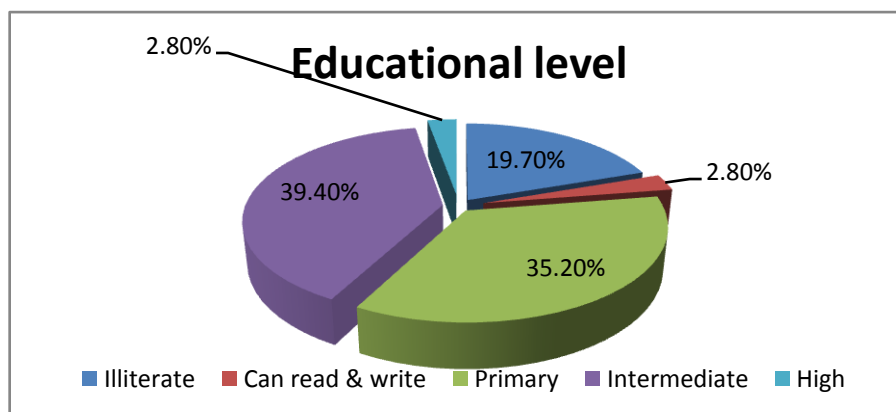
**Table (6):** This table shows that, there were statistically significant

**Table (1):** Demographic characteristics of the control group.

differences between both groups (control and study) regarding to 3rd day, 7th day and 10th day respectively. While there were no significant differences between both groups regarding to the total healing process before the intervention.

**Table (7):** This table reveals that, there were highly statistically significant differences between both groups (control and study) regarding to 3rd day, 7th day and 10th day. While there were no significant differences between both groups regarding to the total pain scores before the intervention.

| Items          | Routine care N=71 |         |
|----------------|-------------------|---------|
|                | No                | %       |
| Age            | 22.00±4.91        |         |
| Marital status |                   |         |
| Married        | 71                | (100%)  |
| Divorce        | 0                 | (0%)    |
| Widow          | 0                 | (0%)    |
| Occupation     |                   |         |
| Housewife      | 69                | (97.2%) |
| Worker         | 2                 | (2.8%)  |
| Income         |                   |         |
| Enough         | 36                | (50.7%) |
| Not enough     | 35                | (49.3%) |

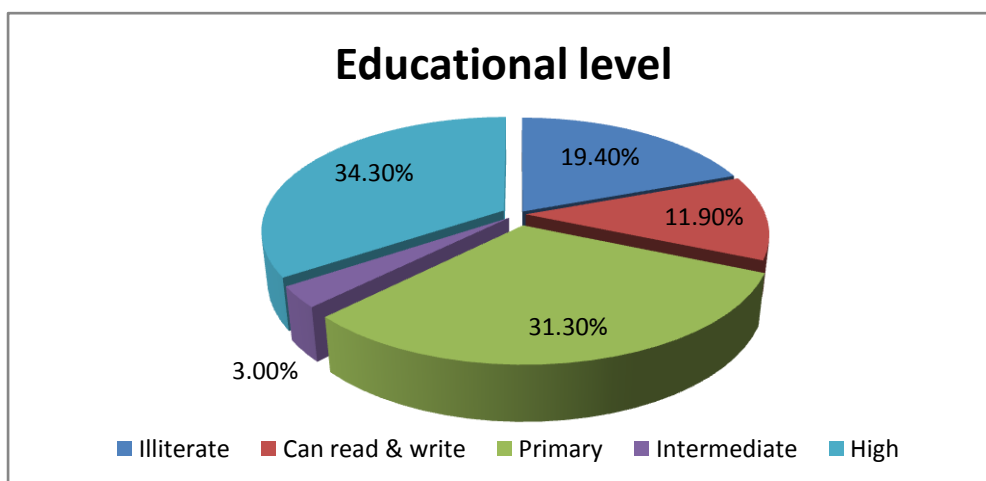


**Figure (1):** Educational level of the control group.

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**Table (2):** Demographic characteristics of the study group

| Items          | Saline N=67 |         |
|----------------|-------------|---------|
|                | No          | %       |
| Age            | 20.68 ±2.34 |         |
| Marital status |             |         |
| Married        | 67          | (100%)  |
| Divorce        | 0           | (0%)    |
| widow          | 0           | (0%)    |
| Occupation     |             |         |
| Housewife      | 64          | (95.5%) |
| Worker         | 3           | (4.5%)  |
| Income         |             |         |
| Enough         | 38          | (56.7%) |
| Not enough     | 29          | (43.3%) |



**Figure (2):** Educational level of the study group



**Table (3): Obstetric history of the control group**

| Items                       | Routine careN=71 | %       |
|-----------------------------|------------------|---------|
| Gravida                     |                  |         |
| Primigravida                | 55               | (77.4%) |
| Multigravida                | 16               | (22.5%) |
| Number of previous labor    |                  |         |
| No                          | 55               | (77.4%) |
| 1-2                         | 16               | (22.5%) |
| Time of previous labor N=16 |                  |         |
| 1-2 year                    | 14               | (87.5%) |
| ≥3 years                    | 2                | (12.5%) |
| Number of childN=16         |                  |         |
| 1-2                         | 16               | (100.0) |
| Types of episiotomy         |                  |         |
| Medio-lateral               | 63               | (88.7%) |
| Median                      | 8                | (11.3%) |
| Lateral                     | 0                | (0%)    |
| J-shape                     | 0                | (0%)    |
| Modified median             | 0                | (0%)    |

**Table (4): Obstetric history of the studied group**

| Items                       | SalineN=67 | %        |
|-----------------------------|------------|----------|
| Gravida                     |            |          |
| Primigravida                | 48         | (71.6%)  |
| Multigravida                | 19         | (28.4%)  |
| Number of previous labor    |            |          |
| No                          | 48         | (71.6%)  |
| 1-2                         | 19         | (28.4%)  |
| Time of previous labor N=19 |            |          |
| 1-2 year                    | 14         | (73.7%)  |
| ≥3 years                    | 5          | (26.3%)  |
| Number of childN=19         |            |          |
| 1-2                         | 19         | (100.0%) |
| Types of episiotomy         |            |          |
| Medio-lateral               | 63         | (94%)    |
| Median                      | 4          | (6%)     |
| Lateral                     | 0          | (0%)     |
| J-shape                     | 0          | (0%)     |
| Modified median             | 0          | (0%)     |

**Table (5): Comparison of (REEDA parameters) episiotomy healing process in the two groups before intervention**

| REEDA                                       | Saline<br>N=67 | Routine care<br>N=71 | P- value |
|---|----------------|----------------------|----------|
| <b>REEDA Parameters before intervention</b> |                |                      |          |
| Redness                                     | 1.95±0.63      | 2.02 ±.357           | 1.52     |
| Edema                                       | 2.05 ±.0.22    | 2.07±0.26            | 0.72     |
| Ecchymosis                                  | 2.32±.474      | 2.17±.384            | 0.57     |
| Discharge                                   | 2.15±.426      | 2.05±.22             | 1.27     |
| Approximation                               | 2.02±.27       | 2.07±.26             | 0.81     |

**Table (6): Comparison of the total episiotomy healing in the two groups after intervention**

| Total<br>(REEDA scale, 0-15) | Saline group<br>N=67 | Routine care group<br>N=71 | P-value |
|------------------------------|----------------------|----------------------------|---------|
| Baseline (day of delivery)   | 2.98±0.40            | 2.15±1.47                  | 0.45    |
| 3rd day                      | 1.56±0.54            | 1.94±0.19                  | 0.001** |
| 7th day                      | 1.32±0.26            | 1.76±0.45                  | 0.002** |
| 10th day                     | 1.09±0.22            | 1.41±0.29                  | 0.031*  |

**Table (7): Comparison of Episiotomy pain scores among control and study group during postnatal period**

| Pain score                 | Saline<br>N=67 | Routine care<br>N=71 | P-value |
|----------------------------|----------------|----------------------|---------|
| Baseline (day of delivery) | 7.29±1.41      | 7.38±1.13            | 0.06    |
| 3rd day                    | 5.83±1.56      | 6.21±2.04            | 0.000** |
| 7th day                    | 4.07±2.12      | 5.37±1.99            | 0.000** |
| 10 days                    | 1.52±1.41      | 2.94±1.7             | 0.001** |

## Discussion

Concerning the demographic characteristics of the study sample, the present study showed that the mean age in the study and control groups was (20.68 and 22 years) respectively. As for the educational level, the results showed that slightly more than one third of the studied sample had intermediate level of education in control group and high level of education in study group. This great number of educated women is reflected upon their cooperation during accepting and practicing perineal care in the study group.

The previous study finding that has been done in El Minia was in the same line with *Hoda & Nahed (2012)* who studied effect of self perineal care instructions on episiotomy pain and wound healing of postpartum women and it was found that statistical significant relation between women's educational level their practicing of perineal self-care in the study group.

Regarding obstetrical history of the studied sample, the current study findings showed that about three quadrants of the studied women were primigravida in control and study groups. The majority of both groups' episiotomy type was Medio-lateral episiotomy.

The previous study finding that has been done in Nigeria was supported with *Izuka, et al. (2014)* who stated that episiotomy is usually administered for several reasons including to prevent severe perineal laceration/tear in the parturient, especially in the primigravida

Medio-lateral episiotomy is done commonly. Because the Extension to the anal sphincter is less common so it is more suitable for instrumental delivery and in short perineum, In general, median episiotomies are more commonly performed in the USA, while mediolateral episiotomies are more common in other parts of the world *Kilpatrick et al (2007)*.

Concerning the comparison of both groups regarding the status of wound healing process scores at the episiotomy site which evaluated by REEDA scale, the present study showed that there was non statistically significant difference in relation to redness, edema, ecchymosis, discharge and suture approximation at before intervention between two groups. This finding may be due to the exhausted of the mother from the first day of delivery which means that she can't start any hygienic care for the perineal.

The current study finding that has been done in Tehran, Iran was in the same line with a study conducted by *Eghdampour (2014)* who studied the effect of Aloe Vera and Povidon-iodine on episiotomy healing, that reported no statistically significant differences detected in Redness, Edema, Ecchymosis, Discharge and Approximation (REEDA) before intervention, between both groups.

Concerning the comparison of the total episiotomy healing in the two groups after intervention, the results of the current study showed that there were statistically significant differences between both groups in favorite to saline

(control and study) regarding to 3rd day, 7<sup>th</sup> day and 10<sup>th</sup> day this finding confirmed the hypothesis putative by the researcher. However, there were no statically significant differences between both groups at the day of delivery.

The previous finding that has been done in Australia is confirmed by *Fernandez et al (2012)* who conducted a study to assess the effects of normal saline with other solution for wound healing. The findings suggested that more than half of the mothers treated with normal saline had good healing. Slightly more than one third of the mother treated with other solutions had got skin irritation. The result showed that normal saline is effective in reducing the infection rate and promoting the healing of episiotomy wound than any other solutions which help to improve the healing process. The study concluded that normal saline can be used as a healing agent which will not interfere with the normal healing process.

These findings that has been done in Bulgaria were in agreement with a study conducted by *Ivanov et al. (2012)* who evaluated the efficacy of topical application of Sodium Salt in episiotomy and caesarean section surgical wounds. The result showed that REEDA scale was significantly lower in sodium salt application. No wound dehiscence was observed, in which sodium salt was applied. The study concluded that sodium salt is reasonable wound care option, especially in cases, when wound complications are expected.

Similar to our study findings that has been done in Arak there is also a study done by *Attarha and Moses (2011)* who studied the effect of water and soap irrigation with Routine care and normal saline in the treatment of patient with episiotomy wound. It was found that

about slightly less than half of episiotomy wound closure has been occurred faster in normal saline and routine care group. In water and soap irrigation group about less than quarter of episiotomy wound got infection. The study concluded that Routine care and normal saline enhance the episiotomy wound closure.

Regarding the comparison of Episiotomy pain scores among control and study group by visual analogue scale during postnatal period, the current study shows a statistically significant differences between both groups (control and study) regarding pain score at 3rd day, 7th day and 10th day. On the other hand, there were no statistically significant differences between both groups at the day of delivery. This may be due to the fact that episiotomy wound is neglected aspect in postnatal case both by the health personnel and mother themselves as soon as care.

In accordance with the findings that has been done in Iran of the current study *Sheikhanetal. (2011)* investigating the effective-ness of ice pack containing normal saline on the episiotomy wound. The results shown that the mothers had significantly less pain on episiotomy wound. The study concluded that the application of ice pack containing normal saline can be used in the post-natal wards and at home setting. The previous result is in the same line with our study finding that indicating, the effective of using normal saline packs to relive pain from episiotomy

The current study findings that has been done in Tehran were in agreement with another study done by *Eghdampour (2014)* which revealed that there were no statistically significant differences in pain intensity scores in two groups (Aloe Vera and Povidon-iodine) before intervention ( $p \leq 0.58$ ) and 8 hours ( $p \leq 0.69$ ) after episiotomy.

The present study emphasized that normal saline is effective treatment of episiotomy wound healing as well as lessening pain scores which can reduce the suffering of mothers and enhance healing as the healing occurs without local antibiotics or disinfectants.

### Conclusions

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The finding and research hypothesis of the present study cast light on some of important features about effect of normal saline on the healing of episiotomy wound.

- Normal saline had a positive effect on the healing of episiotomy wound among postnatal mothers in form of lower REEDA scale score and pain scores VAS.

### Recommendations

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- In the light of the finding of the study, the following recommendations are suggested; Educational sessions to increase women awareness about use of normal saline after episiotomy in form of leaflet or counseling session should be adopted, integrate the saline dressing as a main part in discharge plan, further research to be replicate the study on large sample to determine the factors affecting episiotomy wound healing. Moreover, the findings of the study should be generalized to other clinical settings and the study itself should be done using larger samples. Also, a further study can be done so as to assess both knowledge and practices of the obstetric nurses regarding their application of normal saline for the wound healing.

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