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# Continuous suturing technique comparative to interrupted suturing in repair of episiotomy

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ORIGINAL ARTICLE

# Continuous Suturing Technique Comparative to Interrupted Suturing in Repair of Episiotomy

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**Abstract**

*Background*: **Episiotomy is a surgical incision that is done on the perineum to simplify delivery by decreasing the resistance of the outlet's soft tissues and straightening the pelvic canal.**

*Aim and objectives*: **To compare the efficacy of continuous versus interrupted suturing in the healing of the episiotomy following the first-time mother's delivery.**

*Patients and methods*: **This randomized comparative research was established on 200 women undergoing an episiotomy. Cases were randomly allocated into two groups: group A: the included 100 cases used a continuous suturing approach for wound closure (No. 2/0 polyglactin-910 (vicryl) sutures). Group B: the included 100 cases used interrupted sutures for their repairs (No. 2/0 polyglactin-910 (vicryl) sutures).**

*Results*: **About 24 % of females in the continuous group and 35 % of females in the interrupted group developed wound infection, while 31 % of women in the continuous group and 33 % of females in the interrupted group experienced wound dehiscence. While there was a statistically significant difference among the groups after 12 h ($P = 0.003$), there was no significant difference between the two groups after 2 weeks ($P > 0.05$) on the REEDA, Redness, Oedema, Ecchymosis, Discharge, Approximation (REEDA) scale. Visual Analogue Scale (VAS) score at 6 and 12 h was significantly higher in the interrupted group matched to the continuous group ($P < 0.001$).**

*Conclusion*: **Less short-term discomfort, repair time, and dyspareunia were associated with the utilization of the continuous suture approach for perineal closure. The continuous method is simple to implement and more cost-effective than the interrupted method.**

*Keywords:* Continuous suture technique, Dyspareunia, Episiotomy, Perineal closure

## 1. Introduction

An episiotomy is a surgical incision done on the perineum that helps simplify delivery by decreasing the resistance of the outlet's soft tissues and straightening the pelvic canal.[1]

Sutures could be used in more than 69 % of women who give birth vaginally due to perineal damage. Episiotomy is considered more beneficial than hysterectomy because it can prevent vaginal rips, protect against incontinence, prolapse, and recover faster than hysterical hysterectomy.[2]

Although there is evidence to support the selective use of episiotomy with contraindication for routine use, the true indications for performing an episiotomy in contemporary practice are still unknown.[3]

According to the American College of Obstetricians and Gynecologists, whether or not an episiotomy is performed should be determined by medical evidence. There are no specific conditions in which episiotomy is necessary.[4]

Physical, social, or mental health concerns in the mother after a perineal repair, whether temporary or permanent, can hinder her capacity to care for her child and her family.[5]

Continuous sutures can create a quick, painless, and hemostasis- and scar-free closure of two surfaces.[1] The major drawback includes the need to remove all of the stitches in case of infection. Also,

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the impossibility of draining serous or bloody oozing from beyond the suture line, and the resulting thick scar.[6]

Interrupted sutures are used when single sutures must be removed or there is a high danger of infection or serious bleeding.[2]

To evaluate the differences between continuous and interrupted suturing for episiotomy healing in first-time mothers, we designed this current research.

## 2. Patients and methods

This randomized comparative research was done on 200 laboring females who had a mediolateral episiotomy before vaginal delivery at Al-Azhar University Hospitals and Al-Hussein Hospital, Egypt, over the course of a year.

Inclusion criteria were women who get an episiotomy while giving birth: Women who are full term, presenting in a vertex position, and are between the ages of 20 and 30. Exclusion criteria were high-risk pregnant women included those with hypertension, anemia, a bleeding tendency, or a suspected genital infection; past perineal surgery; cases with reduced immunity (such as those with diabetes mellitus or those taking corticosteroids); patients with a body mass index (BMI) greater than or equal to 30; and those who underwent instrumental vaginal delivery.

Patients were randomly divided into two groups, group A: the included 100 cases used a continuous suturing approach for wound closure (No. 2/0 polyglactin-910 (vicryl) sutures). Group B: the included 100 cases used interrupted sutures for their repairs (No. 2/0 polyglactin-910 (vicryl) sutures).

### 2.1. Methodology

All females were subjected to full history taking (identification information, age, address, relatives, symptoms, previous pregnancies, delivery experiences, BMI, and medical and family background). General examination for vital signs, including blood pressure, heart rate, temperature, and check the fetal heart rate and palpate the mother's abdomen during an abdominal examination. Local pelvic checkup was assessed through vaginal examination. Laboratory investigations: complete blood count, urine analysis, random blood sugar, and abdominal ultrasound were performed.

In the second stage of labor, women received a local anesthetic (5–10 cm of xylocaine) and use scissors to perform a mediolateral episiotomy when the baby's head has crowned.

After the placenta was removed and a pack was placed vaginally to distinguish among uterine blood and bleeding from the episiotomy wound, the incision was healed. In the research, No 2/0 suture material was used. The first step was a complete damage assessment.

For group A, vaginal closure was achieved by insertion of continuous stitches beginning at the wound apex and terminating in a loop knot at the fourchette level. After that, 3 or 4 continuous sutures were used to realign the deep and superficial perineal muscles, and then the perineal skin was closed with stitches.

The vaginal epithelium in group B was closed with an interrupted stitch that began above the wound apex and was completed at the fourchette level. After using 3–4 interrupted sutures to reattach the deep and superficial muscle layers, the skin was closed using interrupted transcutaneous stiches.

Postoperative care included removal of the vaginal pack, discussion of local wound care, and the administration of 1 gm of second-generation cephalosporin as a prophylactic antibiotic before each woman was released from the labor and delivery room.

Patient medical history was documented and follow-up was done through telephone calls or visits on a regular basis. Each woman was monitored for 12 h following the delivery to determine if she required any more analgesics or relief from perineal pain. After the initial 48 h, patients were reviewed once a week for the first month, and once a month for the next three months.

### 2.2. Outcome

#### 2.2.1. Primary outcome

Intraoperative evaluation of: Suture material usage was calculated by deducting the remaining suture length from the total length. The duration of the episiotomy repair was timed from the beginning of the vaginal suturing to the end of the transcutaneous suturing. Patients are assigned a score between zero and three based on their perceived level of blood loss after episiotomy healing. 1) Bleeding less than 200 ml, (2) Quantity of blood lost: about 200–250 ml. (3) More than 250 ml of blood loss.

#### 2.2.2. Follow-up in the first 4 weeks

Postpartum peritoneal pain and the requirement for analgesics up to 48 h were assessed. A Visual Analogue Scale (VAS) was utilized to monitor the cases's perineal pain. Evaluation of perineal repair using the REEDA, Redness, Oedema, Ecchymosis, Discharge, Approximation (REEDA) Scoring Scale

(a method for estimating the inflammatory response and tissue healing following perineal trauma): Dehiscence and infection in wounds: a clinical assessment by using traditional infection symptoms.

*2.2.3. Secondary outcome (3 months)*

Cosmetic disfigurement, patient satisfaction, and anal sphincter dysfunctions (particularly dyschezia) were assessed.

*Ethical approval*

The study was performed after approval of the ethical committee of the Faculty of Medicine, Al-Azhar University. All participants obtained a written informed constant. All procedures involving human subjects were performed in line with the World Medical Association's Declaration of Helsinki.

*2.3. Statistical analysis*

SPSS (Statistical Package for the Social Science) version 24 and NCSS 12, ARMONK, USA, were used to conduct statistical analyses on the gathered data. To determine if the data were normally distributed, we utilized the Shapiro–Wilk test using histograms. Analyses of quantitative parametric data were performed using an unpaired Student t-test, with the results provided as means and standard deviations. Non-normal quantitative data were analyzed using the Mann–Whitney test and provided as a median and IQR. Chi-square and Fisher's exact tests were used to interpret the significance of the relationships between qualitative variables provided as frequencies and percentages. The cutoff for statistical significance was set at a two-tailed $P$ value of less than 0.05.

## 3. Results

Two hundred laboring women at Al-Azhar University Hospitals and Al-Hussein Hospital who had a mediola episiotomy before vaginal birth participated in this prospective randomized comparative study.

The continuous and interrupted groups were comparable regarding clinico-demographic data as shown in Table 1. The median age in continuous and interrupted groups was 29 years and 28 years, respectively, with no statistically significant differences among the 2 groups concerning age ($P > 0.05$). Furthermore, there was no statistically significant difference among the two groups as regards occupation and consanguinity ($P > 0.05$). Also, there was no statistically significant difference among the two groups as regards antenatal follow-up and BMI ($P > 0.05$).

The continuous and interrupted groups were comparable regarding operative and natal data as shown in Table 2. The median amount of suture material in continuous and interrupted groups was 80 and 86, respectively. There was no statistically

*Table 1. Comparison of clinical characteristics in both techniques (N = 200).*

| | Technique | | Total $N = 200$ | Test | $P$ |
|---|---|---|---|---|---|
| | Continuous $n = 100$ | Interrupted $n = 100$ | | | |
| Age | 29 (16–41) | 28 (16–40) | 29 (16–41) | −0.9 | 0.377 |
| Residence | | | | | |
| Rural | 41 (41 %) | 57 (57 %) | 98 (49.0 %) | 4.5 | 0.034 |
| Urban | 59 (59 %) | 43 (43 %) | 102 (51.0 %) | | |
| Occupation | | | | | |
| Housewife | 44 (44 %) | 49 (49 %) | 93 (46.5 %) | 0.5 | 0.48 |
| Working | 56 (56 %) | 51 (51 %) | 107 (54.5 %) | | |
| Consanguinity | | | | | |
| No | 66 (66 %) | 70 (70 %) | 136 (68 %) | 0.4 | 0.545 |
| Yes | 34 (34 %) | 30 (30 %) | 64 (32 %) | | |
| Antenatal follow-up | | | | | |
| Irregular | 45 (45 %) | 41 (41 %) | 86 (43 %) | 0.5 | 0.477 |
| Regular | 55 (55 %) | 59 (59 %) | 114 (57 %) | | |
| BMI | 27.8 (21.0–35.8) | 27.5 (18.5–35.8) | 27.5 (18.5–35.8) | −0.5 | 0.61 |
| BMI interpretation | | | | | |
| Normal | 19 (19 %) | 23 (23 %) | 42 (21 %) | 1.3 | 0.525 |
| Obese | 28 (28 %) | 32 (32 %) | 60 (30 %) | | |
| Overweight | 53 (53 %) | 45 (45 %) | 98 (49 %) | | |

The Mann–Whitney $U$ test was used to compare quantitative variables expressed as median (range), while the Chi-squared ($\chi^2$) test was used to compare qualitative variables expressed as numbers and percentages.
$P$ value less than 0.05 is significant, $P$ less than or equal to 0.01 is highly statistically significant.

*Table 2. Comparison of operative and natal data in both techniques (n = 200).*

| | Technique | | Total $N = 200$ | Test | $P$ |
|---|---|---|---|---|---|
| | Continuous $n = 100$ | Interrupted $n = 100$ | | | |
| Amount of suture material | 80 (70–88) | 86 (80–88) | 80 (70–88) | −9.6 | <0.001 |
| Epidural anesthesia | | | | | |
| No | 60 (60 %) | 55 (55 %) | 115 (57.5 %) | 0.5 | 0.476 |
| Yes | 40 (40 %) | 45 (45 %) | 85 (42.5 %) | | |
| 1st born | | | | | |
| No | 53 (53 %) | 52 (52 %) | 105 (52.5 %) | 0.1 | 0.778 |
| Yes | 47 (47 %) | 48 (48 %) | 95 (47.5 %) | | |
| Perinium repaired previous delivery | | | | | |
| No | 47 (47 %) | 24 (24 %) | 71 (35.5 %) | 12.4 | <0.001 |
| Yes | 53 (53 %) | 76 (76 %) | 129 (64.5 %) | | |
| Weight of the child at birth | 2950 (1900–3560) | 2900 (200–3500) | 2950 (200–3560) | −0.5 | 0.609 |
| Time needed for episiotomy repair | 12 (10–15) | 16 (12–20) | 14 (10–20) | −12.0 | <0.001 |
| Blood loss | 250 (200–340) | 240 (140–260) | 245 (140–340) | −6.8 | <0.001 |
| <200 | | | | | |
| No | 93 (93 %) | 79 (79 %) | 172 (86 %) | 8.1 | 0.004 |
| Yes | 7 (7 %) | 21 (21 %) | 28 (14 %) | | |
| 200–250 | | | | | |
| No | 47 (47 %) | 24 (24 %) | 72 (35.5 %) | 12.4 | <0.001 |
| Yes | 53 (53 %) | 76 (76 %) | 129 (64.5 %) | | |
| >250 | | | | | |
| No | 60 (60 %) | 97 (97 %) | 157 (78.5 %) | 42.0 | <0.001 |
| Yes | 40 (40 %) | 3 (3 %) | 43 (21.5 %) | | |

significant difference among both groups concerning epidural anesthesia and first born ($P > 0.05$). In addition, there was no statistically significant difference among both groups regarding weight of the child at birth ($P > 0.05$) (Table 3).

About 24 % of females in the continuous group and 35 % of females in the interrupted group developed wound infection, while 31 % of females in the continuous group and 33 % of females in the interrupted group experienced wound dehiscence. Women in both the continuous and interrupted groups reported experiencing dyspareunia at high rates. About 1 % of women in the continuous group had healing abnormalities, while the interrupted group had none.

It was shown that 97 % of women who had their surgery finished were as satisfied as those who had theirs uninterrupted (94 %). Within 2 days, 13 % of

*Table 3. Comparison of operative complications in both techniques (N = 200).*

| | Technique | | Total $N = 200$ $N$ (%) | X2 test | $P$ |
|---|---|---|---|---|---|
| | Continuous $N = 100$ $N$ (%) | Interrupted $N = 100$ $N$ (%) | | | |
| Wound infection | | | | | |
| No | 76 (76 %) | 65 (65 %) | 141 (70.5 %) | 2.9 | 0.089 |
| Yes | 24 (24 %) | 35 (35 %) | 59 (29.5 %) | | |
| Wound dehiscence | | | | | |
| No | 69 (69 %) | 67 (67 %) | 136 (68 %) | 0.1 | 0.762 |
| Yes | 31 (31 %) | 33 (33 %) | 64 (32 %) | | |
| Dyspareunia | | | | | |
| No | 6 (6 %) | 0 (0 %) | 6 (3 %) | 4.3 | 0.038 |
| Yes | 94 (94 %) | 100 (100 %) | 196 (97 %) | | |
| Healing defects after 2 weeks | | | | | |
| No | 99 (99 %) | 100 (100 %) | 199 (99.5 %) | 1.0 | 0.316 |
| Yes | 1 (1 %) | 0 (0 %) | 1 (0.5 %) | | |
| Patient satisfaction | | | | | |
| No | 6 (6 %) | 3 (3 %) | 9 (4.5 %) | 1.0 | 0.306 |
| Yes | 94 (94 %) | 97 (97 %) | 191 (95.5 %) | | |
| Need for analgesia within 2 days | | | | | |
| No | 87 (87 %) | 73 (73 %) | 160 (80 %) | 5.2 | 0.022 |
| Yes | 13 (13 %) | 27 (27 %) | 40 (20 %) | | |

*Table 4. Comparison of REEDA score after 12 h and 2 weeks in both techniques (N = 200).*

| | Technique | | Total $N = 200$ | MW test | $P$ |
|---|---|---|---|---|---|
| | Continuous $N = 100$ | Interrupted $N = 100$ | | | |
| | Median (range) | Median (range) | Median (range) | | |
| REEDA score after12 h | 5 (2–65) | 5 (4–57) | 5 (2–65) | −2.9 | 0.003 |
| REEDA score after 2 weeks | 1 (0–3) | 1 (0–2) | 1 (0–3) | −0.4 | 0.676 |

REEDA, Redness, Oedema, Ecchymosis, Discharge, Approximation.

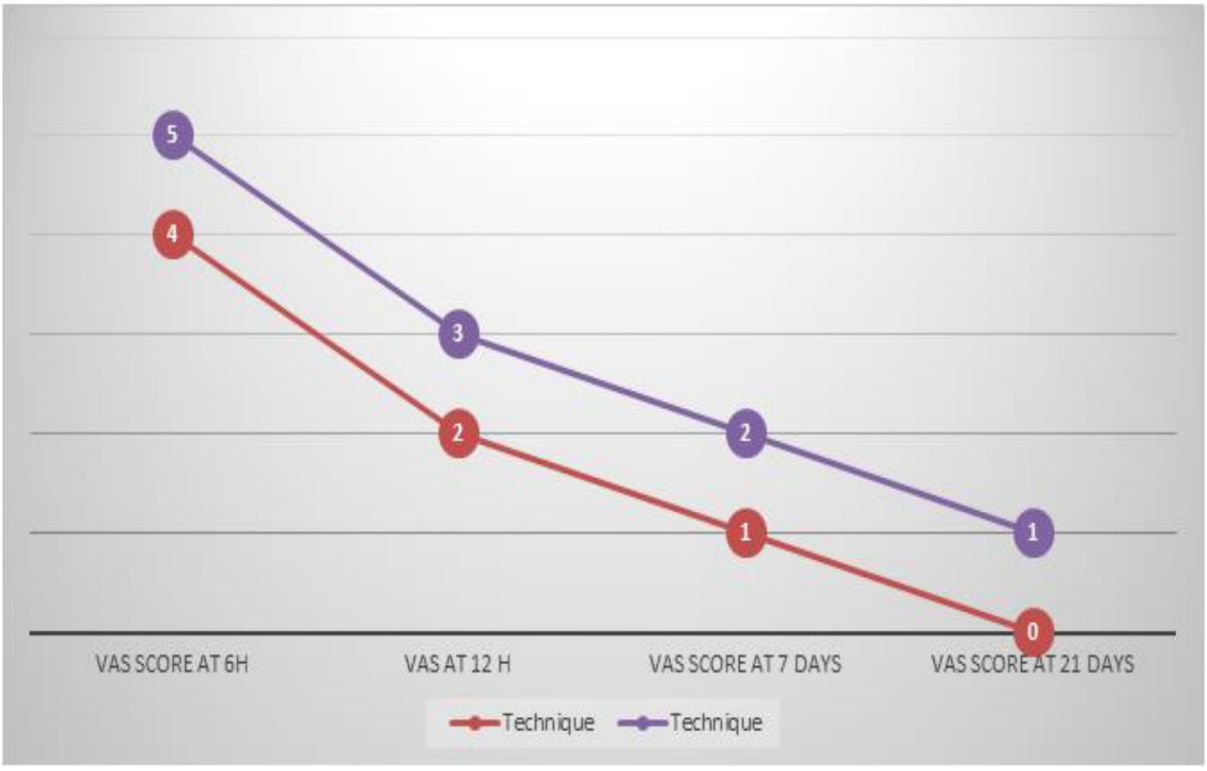


*Fig. 1. Comparison of serial Visual Analogue Scale score values in both techniques (N = 200).*

females in the continuous group and 27 % of females in the interrupted group required analgesia. There was an insignificant difference among both groups in terms of wound infection, wound dehiscence, or healing deficiencies ($P > 0.05$). Furthermore, there was no statistically significant distinction in patient satisfaction among the two groups ($P > 0.05$(.

The continuous and interrupted groups were comparable regarding REEDA score after 12 h and 2

*Table 5. Comparison of serial Visual Analogue Scale score values in both techniques (N = 200).*

| | Technique | | Total $N = 200$ | MW test | $P$ |
|---|---|---|---|---|---|
| | Continuous $N = 100$ | Interrupted $N = 100$ | | | |
| | Median (range) | Median (range) | Median (range) | | |
| VAS score at 6 h | 4 (3–6) | 5 (3–7) | 5 (3–7) | −6.5 | <0.001 |
| VAS at 12 h | 2 (1–3) | 3 (2–4) | 3 (1–4) | −10.1 | <0.001 |
| VAS score at 7 days | 1 (0–2) | 2 (1–3) | 1 (0–3) | −8.6 | <0.001 |
| VAS score at 21 days | 0 (0–1) | 1 (0–2) | 1 (0–2) | −6.5 | <0.001 |

Quantitative variables were expressed as median (range) and compared using Mann–Whitney *U* test.
*P*-value less than 0.05 is significant, *P* less than or equal to 0.01 is highly statistically significant.
VAS, Visual Analogue Scale.

weeks as shown in Table 4. REEDA score after 12 h was significantly greater in the interrupted group than the continuous group ($P = 0.003$), while there was no significant difference among both groups regarding REEDA score after 2 weeks ($P > 0.05$) (Fig. 1).

The continuous and interrupted groups were comparable regarding serial VAS score values as shown in Table 5. VAS score at 6 h and at 12 h was significantly higher in the interrupted group matched to the continuous group ($P < 0.001$). Also, VAS score after 7 days and at 21 days was significantly higher in the interrupted group matched to the continuous group ($P < 0.001$). This means that the continuous group had higher improvement and less pain compared with the interrupted group.

## 4. Discussion

Because of the prevalence of genital surgery problems in Egypt, the danger of genital tract laceration is elevated during hospital deliveries, making episiotomy normal rather than the exception.[7]

The purpose of this research was to examine the effectiveness of continuous versus interrupted suturing for episiotomy repair in primigravida birth using a prospective randomized comparative interventional trial with 200 women who underwent episiotomy.

This study revealed a statistically significant increased amount of suture used among interrupted suturing episiotomy compared with continuous episiotomy with *P*-value less than 0.001. Similarly, according to Samal et al.,[1] a trial was conducted on 141 women and reported a statistically significant increase in the amount of suture in interrupted groups compared with the continuous group with *P*-value less than 0.00. In agreement with Jena and Kanungo study that was performed on 211 women to evaluate the impact of continuous versus interrupted suturing, they found a statistically significant less suture material in continuous suturing compared with interrupted suturing with *P*-value = 0.000. Also, research by Ch et al.,[8] on 547 women who had vaginal episiotomies to determine the best method for repairing an episiotomy, found that the continuous group used significantly less suture material than the interrupted procedure ($P < 0.05$).[9]

Hasanpoor et al.[10] found that continuous repair used significantly less suture material than interrupted repair. According to Peveen et al.,[11] a study was conducted on 200 women and revealed a statistically significant increased amount of sutures among the interrupted group matched to the continuous group with *P*-value = 0.000.

This study revealed a statistically significant longer duration of episiotomy repair among interrupted suturing episiotomy compared with continuous episiotomy with *P*-value less than 0.001. This goes in line with Soliman et al.[2] research that was made on 75 continuous episiotomies and 75 interrupted episiotomies to assess the effects of both techniques on episiotomy repair and revealed a statistically significant longer duration of episiotomy among interrupted suturing 15.62 ± 2.77 compared with the continuous group 12.6 ± 1.85 with *P*-value less than 0.001.[2] Similarly, according to López-Lapeyrere et al.,[12] research was conducted on 83 women who underwent episiotomy to compare different types of suturing techniques and showed a statistically significant longer time of repair with interrupted technique compared with continuous repair with *P*-value less than 0.05. This was in line with Bahulekar et al.,[13] who studied 50 continuous suture techniques compared with 50 interrupted suture techniques and found a statistically significant longer duration greater than 10 min with interrupted technique compared with continuous technique although there was no significant difference as regards postoperative pain. In agreement with Dash et al.,[14] a study was conducted that included 350 continuous repairs and 350 interrupted repairs and revealed a statistically significant longer duration of repair among the interrupted group greater than 5 min ($n = 291$) compared with the continuous group ($n = 41$) with *P*-value = 0.0001. Similarly, in another study by Valenzuela et al.,[15] research was conducted on 445 females who had vaginal delivery episiotomies and reported a statistically significant longer duration of repair among the interrupted group matched to the continuous group with *P*-value = 0.017. The same was reported by Kokanali et al.[16] that was conducted on 160 women and revealed a statistically significant longer duration of repair among the interrupted group matched to the continuous group with *P*-value = 0.000, and Kettle et al.,[17] who revealed a statistically significant longer duration of repair among interrupted episiotomy compared with continuous episiotomy.

As regards postoperative complications, dyspareunia was significantly higher in interrupted episiotomy compared with continuous episiotomy with *P*-value = 0.013. This agreed with Mohamed et al.,[18] an Egyptian research revealed a statistically significant increased dyspareunia in interrupted episiotomy compared with continuous episiotomy repair with *P*-value = 0.001.[18]

In line with Samal et al.,[1] a study was done on 141 women to examine the outcomes of continuous versus interrupted suturing for episiotomy and found that interrupted episiotomy resulted in significantly more dyspareunia than continuous episiotomy with *P*-value = 0.007.[1] Also, according to Martinez-Galiano et al.,[19] a study was conducted on 70 women who underwent episiotomy to assess if the continuous or interrupted techniques have an impact on pain and postpartum problems and reported a statistically significant lower dyspareunia up to 3 months among continuous suture technique group matched to the interrupted group with *P*-value less than 0.001.

Regarding postoperative complications, increased need for analgesia was significantly higher among interrupted episiotomy compared with continuous episiotomy with *P*-value = 0.013. Similarly, Nagure et al.[20] study reported a statistically significant decreased need for postoperative analgesia among continuous suturing compared with the interrupted group. Another study by Howida et al.[21] found that perineal pain at 48 h, 6–10 days, and the need for pain medication and VAS scores were all decreased in patients who underwent continuous compared with interrupted perineal repair.

This study revealed a statistically significant lower REDA score among interrupted episiotomy cases compared with continuous with *P*-value = 0.003. This goes in line with Khatri et al.[22] research that was done on 200 women (100 with continuous suturing and 100 interrupted suturing) to compare both techniques and revealed a statistically significant lower REDA score in interrupted technique compared with continuous technique in continuous group day 1 3.60, day 2 was 2.9, and day 3 was 2.19, while for the interrupted group on day 1 was 3.07, day 2 was 2.47, and for day 3 was 1.83, with *P*-values 0.005, 0.009, and 0.037, respectively.

On the other hand, Kindberg et al.[23] compared interrupted versus continuous suturing techniques and reported no statistically significant difference among both groups as regards postoperative pain assessed by VAS score and their REEDA score with *P*-value greater than 0.05.

Similarly with our findings, Nagure et al.[20] showed lower VAS score with continuous groups than the interrupted group at 12 h and 48 h. On the contrary, 25.

According to Aslam et al.,[24] a study was conducted on 67 women (33 continous and 34 interrupted) employing both intermittent and continuous pain assessment techniques, we found no statistically significant difference in pain intensity among groups with *P*-value greater than 0.05.[24]

Tandon et al.[25] conducted a study on 100 continuous repair groups and 100 interrupted repair groups for episiotomy and showed a statistically significant lower VAS score for pain and less suture material used among continuous technique compared with interrupted technique with *P*-value less than 0.05.

### 4.1. Conclusion

The use of continuous sutures to close the perineum has been linked to less complications such as discomfort and dyspareunia in the postoperative period. The continuous method is not only simpler to implement, but also more cost-effective compared with the interrupted method. Further, larger multicenter cohorts are needed to validate our findings.

## Disclosure

The authors have no financial interest to declare in relation to the content of this article.

## Authorship

All authors have a substantial contribution to the article.

### Conflicts of interest

The authors declared that there were NO conflicts of interest.

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