ISSN: 2320-7159
IJMR
INTERNATIONAL JOURNAL OF MEDICAL RESEARCH

ORIGINAL RESEARCH ARTICLE

Comparative Study on Continuous Versus Interrupted Suturing of Episiotomy

Divya Ojha[1*], Sangeeta Gupta[2], Mandvi Tarun[3], Nitya Nair[4], Prachi Yadav[5]

[1-5]Department of OBGY, Saraswathi institute of medical sciences, Hapur, India

*Dr Divya Ojha (Email: divya.ojha09@gmail.com)

DOI: https://doi.org/10.55489/ijmr.120420245

Citation: Ojha D, Gupta S, Tarun M, Nair N, Yadav P. Comparative Study on Continuous Versus Interrupted Suturing of Episiotomy. Intl J Med Res 2024;12(4):78-85. DOI: 10.55489/ijmr.120420245

Received: August 24, 2024
Accepted: September 13, 2024
Published: October 01, 2024

Funding: Non-Declared.

Conflict of interests: The authors have declared that no conflict of interests exists.

Publisher: Medsci Publications, India

ABSTRACT

Introduction: Episiotomy is a frequent obstetric intervention during vaginal delivery, necessitating effective repair techniques to minimize complications and enhance recovery. Continuous and interrupted suturing techniques are widely used, but their comparative efficacy remains debated. This study evaluates the impact of these techniques on wound healing, pain, complications, and patient satisfaction.

Method: A prospective comparative study was conducted over two years at Saraswathi Institute of Medical Sciences, Hapur, involving 200 women undergoing mediolateral episiotomy during vaginal delivery. Participants were randomized into continuous (n=100) and interrupted (n=100) suturing groups. Pain was assessed using the Visual Analogue Scale (VAS), and outcomes such as wound healing, complications, and cosmetic satisfaction were evaluated at 48 hours, one week, six weeks, and three months. Statistical analysis included Chi-square and t-tests.

Results: Continuous suturing required significantly less analgesia at 2 hours (28% vs. 85%, $p < 0.001$) and 48 hours (17% vs. 32%, $p = 0.01$). Pain scores in lying, sitting, and walking positions were consistently lower at 2 hours in the continuous group ($p < 0.05$). Continuous suturing also resulted in fewer cases of edema at 2 hours (4.0% vs. 14.0%, $p = 0.013$) and 48 hours (2.0% vs. 10.0%, $p = 0.017$). Wound dehiscence was significantly less frequent in the continuous group at 1 week (1.0% vs. 14.0%, $p = 0.001$).

Conclusion: Continuous suturing offers superior outcomes in reducing early pain, edema, and wound dehiscence compared to interrupted suturing, making it a preferred technique for episiotomy repair.

Key-words: Episiotomy, Continuous suturing, Interrupted suturing, Wound healing, Maternal outcomes

INTRODUCTION

Childbirth is a significant and transformative experience, with episiotomy being a common intervention during vaginal delivery. Episiotomy involves a deliberate incision of the perineum to facilitate delivery and prevent severe perineal tears, but the optimal suturing technique for repair remains debated.[1] The goal of episiotomy repair is effective wound healing with minimal complications such as infection, pain, and dyspareunia. Suturing methods, particularly continuous and interrupted techniques, play a critical role in achieving these outcomes.[2]

Continuous suturing, which employs a single, uninterrupted line of stitches, is efficient and distributes tension evenly along the wound, while interrupted suturing involves placing individual stitches, allowing precision and flexibility but requiring more time.[3] Various factors, including surgeon preference and patient-specific considerations, influence the choice of technique. Although studies like Kettle et al., 2012, have examined their effects on outcomes such as healing, pain, and satisfaction, the evidence remains inconclusive.[4]

Continuous sutures may reduce tissue ischemia and necrosis due to uniform tension, whereas interrupted sutures offer controlled alignment but may risk tissue strangulation if improperly applied.[5] Additionally, the suturing technique can impact postpartum pain, which influences recovery and well-being. Continuous sutures, being faster, might shorten the procedure's discomfort, while interrupted sutures could minimize pain during healing due to precise tissue alignment.[6]

Patient satisfaction, encompassing factors like cosmesis, sexual function, and psychological well-being, is increasingly recognized as vital. Studies highlight the potential psychological benefits of continuous sutures and the individualized care enabled by interrupted sutures.[7,8] Recent literature emphasizes the need to refine episiotomy repair techniques to optimize patient outcomes and improve recovery experiences.[8,9]

This study aims to systematically evaluate the implications of continuous versus interrupted suturing techniques on wound healing, complications, pain management, and patient satisfaction. By synthesizing findings and applying rigorous methodologies, we seek to provide evidence-based recommendations to enhance clinical decision-making and care quality for women undergoing episiotomy repair.

MATERIALS AND METHODS

This prospective comparative study was conducted over two years (1st September 2022 to 31st July 2024) in the Department of Obstetrics and Gynaecology at Saraswathi Institute of Medical Sciences, Anwarpur, Hapur. A total of 200 pregnant women undergoing vaginal delivery with mediolateral episiotomy were randomly allocated into two groups (100 in each). One group underwent continuous suturing of all three layers using Vicryl Rapide No. 1-0, while the other group was repaired using the conventional technique (mucosa - continuous, muscle - interrupted, skin - mattress suture) with the same suture material. Inclusion criteria included pregnant women undergoing vaginal delivery with mediolateral episiotomy and willingness to participate, while exclusions were based on factors such as prolonged rupture of membranes, Hb <7 gm%, associated perineal tears, and medical comorbidities.

Data were collected using a predesigned proforma after informed consent. The procedure was performed under local infiltration of 1% xylocaine, noting time and suture material used. Post-delivery, participants were monitored for 2 hours, assessing parameters such as pulse, BP, uterine condition, local swelling, hematoma, and pain via the Visual Analogue Scale (VAS). Standard care included antibiotics for 5 days, ibuprofen for 2 days, and perineal hygiene with povidone iodine. Episiotomy healing was evaluated at 48 hours, one week, and six weeks post-delivery, observing for redness, induration, infection, wound gaping, and pain. Cosmetic outcomes and dyspareunia were assessed at

six weeks and three months. Statistical analysis involved Chi-square and t-tests, with the sample size determined to be 100 per group based on prior prevalence data.

RESULTS

The study compares the demographic and obstetric characteristics of women undergoing continuous versus interrupted suturing for episiotomy repair. The mean age of participants was comparable between groups (27.12 ± 4.9 years in the continuous group and 27.92 ± 4.5 years in the interrupted group). A majority of the participants were aged ≥26 years (57% in the continuous group and 67% in the interrupted group). Gravida distribution showed that 59% of the continuous group and 51% of the interrupted group were second gravidae, while third gravidae accounted for only 8% and 2%, respectively. Parity was evenly distributed between nullipara (48.0% vs. 49.0%) and multipara (52.0% vs. 51.0%).

Table 1: Demographic and Obstetric Profile in Continuous vs. Interrupted Suturing of Episiotomy

Variable	Continuous (%)	Interrupted (%)	Total (%)
Age	27.12+-4.9	27.92+-4.5	27.52+-4.7
<= 25	43 (43.0)	33 (33.0)	76 (38.0)
>= 26	57 (57.0)	67 (67.0)	124 (62.0)
Gravida			
1	33 (33.0)	47 (47.0)	80 (40.0)
2	59 (59.0)	51 (51.0)	110 (55.0)
3	8 (8.0)	2 (2.0)	10 (5.0)
Parity			
Nullipara	48 (48.0)	49 (49.0)	97 (48.5)
Multipara	52 (52.0)	51 (51.0)	103 (51.5)
Locality			
Rural	52 (52.0)	52 (52.0)	104 (52.0)
Urban	48 (48.0)	48 (48.0)	96 (48.0)
Education			
Illiterate	4 (4.0)	12 (12.0)	16 (8.0)
Primary	10 (10.0)	9 (9.0)	19 (9.5)
Secondary	23 (23.0)	21 (21.0)	44 (22.0)
Higher Education	36 (36.0)	39 (39.0)	75 (37.5)
Graduate and above	27 (27.0)	19 (19.0)	46 (23.0)
Gestational Week			
<= 38	33 (55.0)	27 (45.0)	60 (30.0)
> 38	67 (47.9)	73 (52.1)	140 (70.0)

Table 2: Need for Analgesia in Continuous vs. Interrupted Suturing

Need for Analgesia	Continuous (%)	Interrupted (%)	Total (%)	Chi-square	P value
Post 2 Hours	28 (28.0)	85 (85.0)	113 (56.5)	66.1	<0.001*
Post 48 Hours	17 (17.0)	32 (32.0)	49 (24.5)	6.1	0.01*
1 Week Follow-Up	10 (10.0)	17 (17.0)	27 (13.5)	2.1	0.15

Rural and urban locality distribution was identical across both groups (52% rural and 48% urban). Education levels revealed a higher proportion of graduates and above in the continuous group (27% vs. 19%), while illiteracy was more common in the interrupted group (12% vs. 4%). Gestational age was predominantly >38 weeks in both groups, with slightly higher proportions in the interrupted group (52.1% vs. 47.9%).

As shown in Table 2, A significant difference was observed at 2 hours post-repair, with 28% of women in the continuous group requiring analgesia compared to 85% in the interrupted group ($p < 0.001$). At 48 hours, analgesia was needed by 17% of the continuous group and 32% of the interrupted group, also showing a statistically significant difference ($p = 0.01$). However, at 1 week follow-up, the difference was not statistically significant (10% vs. 17%; $p = 0.15$).

Table 3: Comparison of mean VAS score in different position Between groups at different follow-ups

Position	Mean VAS Score	Group			p value
		Continuous	Interrupted	Total	
Lying	2 hr	7.87 ± 0.98	8.51 ± 1.12	8.19 ± 1.10	<0.001*
	48 hr	7.00 ± 0.83	7.23 ± 0.90	7.11 ± 0.87	0.06
	1 wk	3.61 ± 0.70	3.75 ± 0.70	3.68 ± 0.70	0.158
	6 wk	3.07 ± 0.81	3.25 ± 0.70	3.16 ± 0.76	0.094
Sitting	2 hr	8.59 ± 0.73	8.82 ± 0.78	8.70 ± 0.76	0.033*
	48 hr	6.94 ± 0.80	7.16 ± 0.63	7.05 ± 0.73	0.032*
	1 wk	3.71 ± 0.66	3.89 ± 0.74	3.80 ± 0.70	0.07
	6 wk	3.07 ± 0.81	3.13 ± 0.88	3.10 ± 0.84	0.617
Walking	2 hr	8.82 ± 0.64	9.03 ± 0.81	8.92 ± 0.74	0.043*
	48 hr	7.37 ± 0.79	7.44 ± 1.00	7.40 ± 0.90	0.582
	1 wk	4.12 ± 0.70	4.28 ± 0.80	4.20 ± 0.76	0.135
	6 wk	3.49 ± 0.50	3.59 ± 0.51	3.54 ± 0.51	0.166

Table3 shows the evaluation of pain levels using the Visual Analog Scale (VAS) in various positions (lying, sitting, and walking) at 2 hours, 48 hours, 1 week, and 6 weeks post-episiotomy repair.

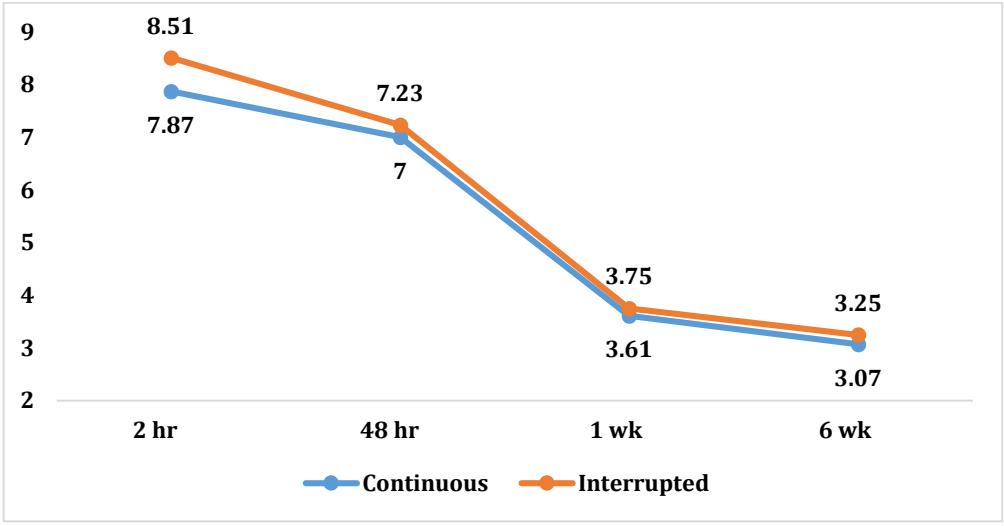

Figure 1: mean VAS score in lying position

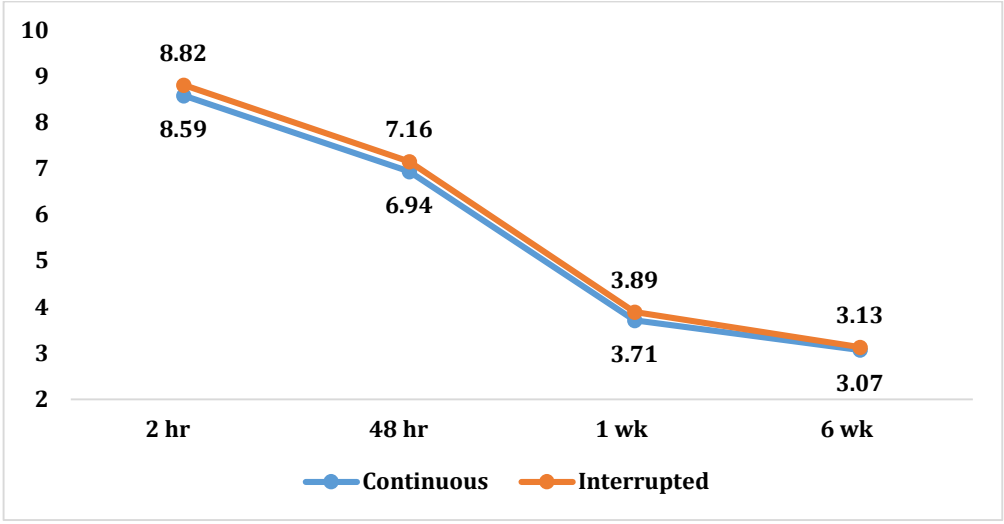

Figure 2: mean VAS score in sitting position

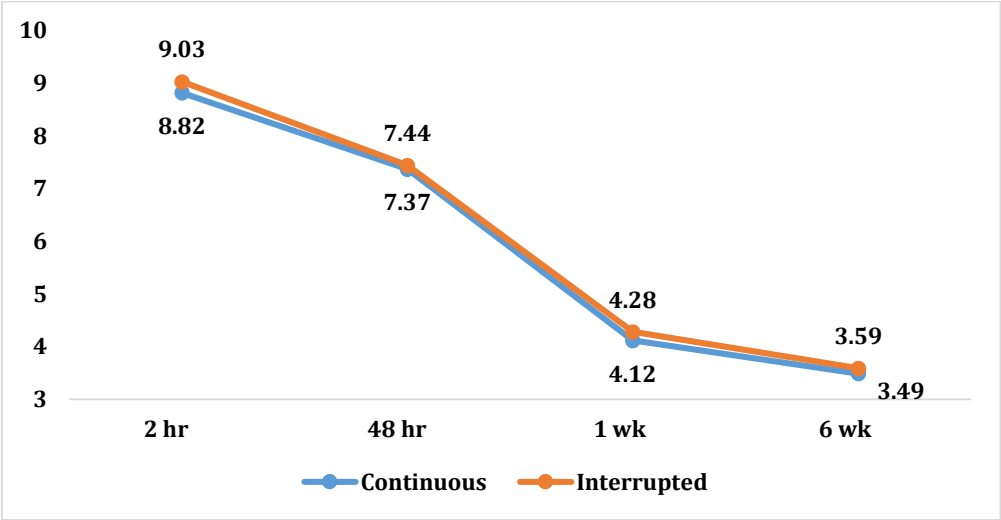

Figure 3: mean VAS score during walking

Table 4: Maternal complications associated with continuous and interrupted suturing techniques after episiotomy repair

Condition	Continuous (%)	Interrupted (%)	Total (%)	p-value
Edema at 2 hours	4 (4.0)	14 (14.0)	18 (9.0)	0.013*
Edema at 48 hours	2 (2.0)	10 (10.0)	12 (6.0)	0.017*
Edema at 1 week	1 (1.0)	2 (2.0)	3 (1.5)	0.56
Edema at 6 weeks	0 (0)	1 (1.0)	1 (0.5)	0.32
Skin irritation due to suture material at 2 hours	3 (3.0)	15 (15.0)	18 (9.0)	0.003*
Skin irritation due to suture material at 48 hours	1 (1.0)	12 (12.0)	13 (6.5)	0.002*
Wound dehiscence at 1 week	1 (1.0)	14 (14.0)	15 (7.5)	0.001*
Wound infection at 6 weeks	2 (2.0)	4 (4.0)	6 (3.0)	0.40
Dyspareunia at 3 months	3 (3.0)	8 (8.0)	11 (5.5)	0.12
Scar fibrosis at 6 weeks	1 (1.0)	3 (3.0)	4 (2.0)	0.31
Hematoma formation at 2 hours	1 (1.0)	3 (3.0)	4 (2.0)	0.31

Lying Position: A significant difference in mean VAS scores was observed at 2 hours post-repair (7.87 ± 0.98 in the continuous group vs. 8.51 ± 1.12 in the interrupted group, $p < 0.001$). No significant differences were found at 48 hours, 1 week, or 6 weeks ($p > 0.05$).

Sitting Position: Pain scores were significantly lower in the continuous group at 2 hours (8.59 ± 0.73 vs. 8.82 ± 0.78, $p = 0.033$) and 48 hours (6.94 ± 0.80 vs. 7.16 ± 0.63, $p = 0.032$). Differences at 1 week and 6 weeks were not statistically significant.

Walking Position: At 2 hours, the continuous group reported significantly less pain (8.82 ± 0.64 vs. 9.03 ± 0.81, $p = 0.043$). Pain scores at 48 hours, 1 week, and 6 weeks were similar between the groups ($p > 0.05$).

Edema was significantly less frequent in the continuous group at 2 hours (4.0% vs. 14.0%, $p = 0.013$) and 48 hours (2.0% vs. 10.0%, $p = 0.017$), while no significant differences were noted at 1 week or 6 weeks. Skin irritation due to suture material was also significantly lower in the continuous group at 2 hours (3.0% vs. 15.0%, $p = 0.003$) and 48 hours (1.0% vs. 12.0%, $p = 0.002$).

Wound dehiscence at 1 week was more common in the interrupted group (1.0% vs. 14.0%, $p = 0.001$). However, wound infection at 6 weeks (2.0% vs. 4.0%, $p = 0.40$), dyspareunia at 3 months (3.0% vs. 8.0%, $p = 0.12$), scar fibrosis at 6 weeks (1.0% vs. 3.0%, $p = 0.31$), and hematoma formation at 2 hours (1.0% vs. 3.0%, $p = 0.31$) did not show significant differences between groups.

Discussion

In our study, we compared the outcomes of continuous and interrupted episiotomy techniques. The mean age of participants in the continuous group (27.12 ± 4.9) was slightly lower than in the interrupted group (27.92 ± 4.5), with an overall mean age of 27.52 ± 4.7. These age distributions are consistent with findings from Khatri et al. (2021) [10] and other studies by Samal et al., [11] Mahmoud et al., and Martínez-Galiano et al. (2019), [12], where age differences in patients undergoing episiotomy were not statistically significant.

These findings echo those of Martínez-Galiano et al.[12], where the gestational age of patients undergoing episiotomy was also not statistically significant. Similarly, in Khatri et al.'s study, a comparison of the gestational age at delivery between the two study groups yielded a non-significant difference, with mean gestational ages of 38.23 in Group A and 38.48 in Group B, and a p-value of 0.663.[10]

In this study, dyspareunia was absent initially but occurred in 5.5% of patients at 3 months. Wound dehiscence, scar fibrosis, and wound infection were reported in 7.5%, 2%, and 3% of patients, respectively, at 48 hours, with minimal occurrences thereafter. Analgesia use was highest at 56.5% within 2 hours, decreasing to 24.5% at 48 hours, 13.5% by 1 week, and resolving completely by 6 weeks. Continuous suturing showed significantly lower pain scores at 2 hours in all positions, with differences fading by 48 hours and no significant difference by 1 and 6 weeks. These findings align with Jenna et al.'s study, which also found continuous suturing to result in less pain initially and fewer complications, such as dyspareunia.[13]

According to the results from Soliman et al., there was a highly statistically significant difference between the two groups regarding the time needed for repair, amount of suture material used, and perineal pain at 6 and 12 hours, as measured by VAS scales, with lower scores in the continuous group. However, there was no significant difference observed after that time point.[14]

Based on the findings from the study by Siahkal et al., the continuous non-locking technique was found to significantly decrease perineal pain levels compared to the interrupted method at 2 hours, 10 days, and 6 weeks post-delivery.[15]

In this study, significant differences in pain levels were observed at 2 hours post-suturing in the lying position, with the continuous suturing group reporting higher pain ($p < 0.001$). Similar significant differences were found while walking at 2 hours, and in both lying and walking positions at 1- and 6-weeks post-suturing ($p < 0.05$). However, pain differences in the sitting position were not statistically significant at 2 hours and 6 weeks. Our findings align with Besen et al., who reported reduced perineal pain and better daily activity engagement in women treated with continuous suturing.[6]

In this study, 28.0% of the continuous suturing group required analgesia at 2 hours compared to 85.0% in the interrupted group ($p < 0.001$). At 48 hours, 17.0% vs. 32.0% needed analgesia ($p = 0.01$), and by one week, 10.0% vs. 17.0% ($p = 0.15$). Overall, 56.5% of participants required analgesia at 2 hours, decreasing to 24.5% at 48 hours, 13.5% at one week, and none at 6 weeks. Martínez-Galiano observed a negative association between continuous sutures and the need for analgesia at 24 hours postpartum (aOR = 0.39; 95% CI = 0.18-0.86).[12]

In this study, edema was less common in the continuous suturing group compared to the interrupted group at 2 hours (4.0% vs. 14.0%, $p = 0.013$) and 48 hours (2.0% vs. 10.0%, $p = 0.017$). By one week, edema was minimal in both groups (1.0% vs. 2.0%, $p = 0.56$), and at six weeks, only 1.0% of the interrupted group had edema ($p = 0.32$). Dyspareunia occurred in 3.0% of the continuous group and 8.0% of the interrupted group at 3 months (overall 5.5%, $p = 0.12$). Wound dehiscence was significantly higher in the interrupted group (14.0%) at one week compared to the continuous group (1.0%, $p = 0.001$), with 7.5% overall experiencing dehiscence.

Jena et al. found no difference in wound dehiscence between the groups (P = 0.361), but the interrupted group had more complaints of dyspareunia (P = 0.009). The continuous group required less suture length (P = 0.000).[13]

Soliman et al. reported no significant differences between the two groups in terms of blood loss, perineal repair rate, analgesic use, postnatal stay, wound infections, healing defects, dyschezia, dyspareunia, cosmetic outcomes, or patient satisfaction.[14]

Our findings demonstrated faster wound healing in the intervention group compared to the control group. Consistently, a systematic review highlighted the superiority of the subcuticular technique over the interrupted transcutaneous technique for wound healing. Additionally, Besen et al. [6] found improved wound healing with the continuous suture technique. However, studies by Perveen et al.[16] and Hasanpoor et al.[17] reported no significant difference between the two techniques in terms of wound healing.

According to Besen et al., the application of continuous suture technique in perineal trauma repair led to decreased perineal pain, reduced requirement for analgesics, improved wound healing, shorter repair duration, and decreased material usage compared to interrupted suture technique.[6]

Conclusion

The study highlights that continuous suturing for episiotomy repair is associated with significantly lower analgesia requirements, pain scores (in lying, sitting, and walking positions), and edema compared to interrupted suturing, particularly during the early postoperative period. Additionally, skin irritation and wound dehiscence were less frequent in the continuous group. However, no significant differences were observed between the groups in long-term outcomes such as wound infection, dyspareunia, scar fibrosis, or hematoma formation. These findings suggest that continuous suturing provides better early postoperative outcomes without compromising long-term healing.

Bibliography

1. Carroli G, Mignini L. Episiotomy for vaginal birth. Cochrane Database Syst Rev 2009:CD000081. https://doi.org/10.1002/14651858.CD000081.PUB2.
2. Choudhari RG, Tayade SA, Venurkar S V, Deshpande VP. A Review of Episiotomy and Modalities for Relief of Episiotomy Pain. Cureus 2022;14. https://doi.org/10.7759/CUREUS.31620.
3. Gurusamy KS, Toon CD, Allen VB, Davidson BR. Continuous versus interrupted skin sutures for non-obstetric surgery. Cochrane Database Syst Rev 2014;2014. https://doi.org/10.1002/14651858.CD010365.PUB2.
4. Kettle C, Dowswell T, Ismail KM. Continuous and interrupted suturing techniques for repair of episiotomy or second-degree tears. Cochrane Database Syst Rev 2012;2012. https://doi.org/10.1002/14651858.CD000947.PUB3.
5. Scalise A, Calamita R, Tartaglione C, Pierangeli M, Bolletta E, Gioacchini M, et al. Improving wound healing and preventing surgical site complications of closed surgical incisions: a possible role of Incisional Negative Pressure Wound Therapy. A systematic review of the literature. Int Wound J 2016;13:1260. https://doi.org/10.1111/IWJ.12492.
6. Aydın Besen M, Rathfisch G. The effect of suture techniques used in repair of episiotomy and perineal tear on perineal pain and dyspareunia. Health Care Women Int 2020;41:22–37. https://doi.org/10.1080/07399332.2019.1663194.
7. Fanshawe AM, De Jonge A, Ginter N, Takács L, Dahlen HG, Swertz MA, et al. The Impact of Mode of Birth, and Episiotomy, on Postpartum Sexual Function in the Medium- and Longer-Term: An Integrative Systematic Review. Int J Environ Res Public Health 2023;20. https://doi.org/10.3390/IJERPH20075252/S1.
8. Myers-Helfgott MG, Helfgott AW. Routine use of episiotomy in modern obstetrics. Should it be performed? Obstet Gynecol Clin North Am 1999;26:305–25. https://doi.org/10.1016/S0889-8545(05)70077-2.
9. Kettle C, Hills RK, Ismail KMK. Continuous versus interrupted sutures for repair of episiotomy or second degree tears. Cochrane Database Syst Rev 2007. https://doi.org/10.1002/14651858.CD000947.PUB2.

10. Rahul K, Bhoomika J, Sabrina M, Sushil K. Comparative study of continuous method and interrupted method of episiotomy in terms of healing of the surgical wound. Clinical Journal of Obstetrics and Gynecology 2021;4:040–3. https://doi.org/10.29328/JOURNAL.CJOG.1001084.

11. Samal SK, Rathod S. Comparative analysis of continuous and interrupted suturing techniques for repair of episiotomy or second degree perineal tear. Int J Reprod Contraception, Obstet Gynecol. 2017; 6: 1002 n.d.

12. Martínez-Galiano JM, Arredondo-López B, Molina-Garcia L, Cámara-Jurado AM, Cocera-Ruiz E, Rodríguez-Delgado M. Continuous versus discontinuous suture in perineal injuries produced during delivery in primiparous women: a randomized controlled trial. BMC Pregnancy Childbirth 2019;19. https://doi.org/10.1186/S12884-019-2655-2.

13. Jena L, Kanungo S. A Comparative Study of Continuous Versus Interrupted Suturing for Repair of Episiotomy or Second Degree Perineal Tear. Int J Reprod Contracept Obstet Gynecol 2015:1. https://doi.org/10.5455/2320-1770.IJRCOG20150210.

14. Soliman LE, Ghareeb MA, Abd Elhameid AAE, Lashin ME-B. Interrupted versus continuous suturing of episiotomy : a comparative study. Zagazig University Medical Journal 2020;26:287–96. https://doi.org/10.21608/ZUMJ.2019.12551.1221.

15. Faal Siahkal S, Abedi P, Iravani M, Esfandiarinezhad P, Dastoorpoor M, Bakhtiari S, et al. Continuous non-locking vs. interrupted suturing techniques for the repair of episiotomy or second-degree perineal tears: A single-blind randomized controlled trial. Front Surg 2023;10:1114477. https://doi.org/10.3389/FSURG.2023.1114477.

16. Perveen F, Pak TS-JS, 2009 undefined. Perineal repair: comparison of suture materials and suturing techniques. OldJspOrgPkF Perveen, T ShabbirJ Surg Pak, 2009•oldJspOrgPk n.d.

17. Hasanpoor S, Bani S, Shahgole R, Gojazadeh M. The Effects of Continuous and Interrupted Episiotomy Repair on Pain Severity and Rate of Perineal Repair: A Controlled Randomized Clinical Trial. J Caring Sci 2012;1:165. https://doi.org/10.5681/JCS.2012.024.