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The Effect of Cold Application After Episiotomy on Wound Healing, Pain, and Postpartum Comfort: Quasi-Experimental Study

Epizyotomi Sonrası Soğuk Uygulamanın Yara İyileşmesi, Ağrı ve Doğum Sonrası Konfor Üzerindeki Etkisi: Yarı Deneysel Çalışma

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Abstract

Objective: This study aimed to determine the effect of cold application performed using a cold gel pad on wound healing, pain, and postpartum comfort in women who underwent episiotomy.

Materials and Methods: The study was conducted with a quasi-experimental design involving 102 women who underwent episiotomy during vaginal delivery (51 experimental, 51 control). A cold gel pad was applied to the experimental group, while the control group received routine postpartum care. Changes in REEDA Scale and Visual Analog Scale (VAS) scores were measured at 0, 1, and 2 hours, and the PCQ was assessed at the 2-hour time point. REEDA and VAS scores were analyzed using Two-Way Mixed Analysis of Variance (Mixed ANOVA), while PCQ scores were analyzed using Student's t-test.

Results: Significant group time interactions were found for REEDA ($F=16.985$, $p<0.001$, partial $\eta^2=0.145$) and VAS scores ($F=35.962$, $p<0.001$, partial $\eta^2=0.264$), indicating greater reductions over time in the experimental group. At the 2-hour assessment, the total PCQ score was significantly higher in the experimental group than in the control group (124.70±8.20 vs 120.33±8.74; $p=0.011$). Psychospiritual ($p=0.025$) and sociocultural comfort scores ($p=0.015$) were also significantly higher in the experimental group, whereas physical comfort scores did not differ significantly between the groups ($p=0.088$).

Conclusion: Cold therapy following an episiotomy reduced REEDA scores and pain levels during the early postpartum period and improved postpartum comfort scores. This practice may be considered as part of routine postpartum care.

Keywords: Cold application, episiotomy, postpartum period, pain, comfort

Öz

Amaç: Bu çalışma, epizyotomi olan kadınlarda soğuk jel ped kullanımı ile gerçekleştirilen soğuk uygulamanın yara iyileşmesi, ağrı ve doğum sonrası konfor üzerindeki etkisini belirlemeyi amaçlamaktadır.

Materyal ve Metot: Çalışma, vajinal doğum sırasında epizyotomi uygulanan 102 kadınla (51 deney, 51 kontrol) yarı deneysel bir tasarımda yürütülmüştür. Deney grubuna soğuk jel ped uygulaması yapılırken, kontrol grubuna rutin doğum sonrası bakım uygulanmıştır. REEDA Ölçeği ve Vizüel Analog Skala (VAS) puanlarındaki değişiklikler 0, 1 ve 2 saatte ölçülmüş; 2. saatte PCQ değerlendirilmiştir. Veriler REEDA ve VAS puanları için İki Yönlü Karışık Varyans Analizi (Mixed ANOVA), PCQ puanları için ise Student t testi kullanılarak analiz edilmiştir.

Bulgular: REEDA ($F=16,985$, $p<0,001$, kısmi $\eta^2=0,145$) ve VAS puanları ($F=35,962$, $p<0,001$, kısmi $\eta^2=0,264$) için grup-zaman etkileşimi anlamlı bulunmuş ve zaman içindeki azalmanın deney grubunda daha fazla olduğu belirlenmiştir. İkinci saat değerlendirmesinde toplam PCQ puanı deney grubunda kontrol grubuna göre anlamlı olarak daha yüksekti (124,70±8,20'ye karşı 120,33±8,74; $p=0,011$). Psikospiritüel ($p=0,025$) ve sosyokültürel konfor puanları ($p=0,015$) deney grubunda anlamlı olarak daha yüksek bulunurken, fiziksel konfor puanları açısından gruplar arasında anlamlı bir fark bulunmamıştır ($p=0,088$).

Sonuç: Epizyotomi sonrası soğuk uygulama, erken postpartum dönemde REEDA puanlarını ve ağrı düzeyini azaltmış, doğum sonrası konfor puanlarını artırmıştır. Bu uygulama, rutin postpartum bakımın bir parçası olarak değerlendirilebilir.

Anahtar Kelimeler: Soğuk uygulama, epizyotomi, postpartum dönem, ağrı, konfor

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INTRODUCTION

Episiotomy is a common obstetric procedure performed by making a controlled incision in the perineal region during labor. Although this procedure is intended to ease the fetus's passage through the birth canal during the second stage of labor, it may also result in several complications that can adversely impact women's quality of life in the postpartum period.[1] The main complications associated with episiotomy include prolonged wound healing, third- and fourth-degree perineal lacerations, infection, hematoma, edema, suture separation, pain, and dyspareunia, as well as functional problems such as the mother's inability to care for herself adequately.[2] In the long term, permanent effects such as rectal incontinence, pudendal nerve damage, scar tissue, and dyspareunia may occur. Postpartum care practices are crucial in preventing and managing such complications. Cold application is frequently preferred in perineal care after episiotomy as a non-pharmacological, cost-effective, and easily accessible method.[3] Cold application, which has a vasoconstrictive effect on vascular structures, slows down the inflammation process, reducing symptoms such as edema, pain, and redness; at the same time, it increases the patient's comfort with its analgesic effect.[4] Ice packs, which are commonly used in the postpartum period today, provide local cold application to the perineal region and help control pain without negatively affecting the breastfeeding process by reducing women's need for pharmacological treatment.[5]

Pain is among the most frequently encountered physical problems experienced by women during the postpartum period. Pain caused by uterine involution, nipple cracks, milk engorgement, cesarean incision, and episiotomy directly affects the mother's comfort. Effective pain management is critical in facilitating the mother's rest, interaction with her baby, and active participation in care processes.[6]

According to the Midwifery Regulation, midwives are responsible for conducting postpartum follow-up, identifying deviations from normal postpartum recovery such as infection, providing hygiene and self-care education, and managing the postpartum period.[7] Midwives must evaluate the effectiveness of interventions used following an episiotomy, and postpartum care practices must be conducted based on evidence. Although previous studies have demonstrated the effectiveness of cold application in reducing pain after episiotomy, further evaluation in different patient populations and clinical settings may strengthen the evidence supporting evidence-based midwifery practice.[8-10]

This study aims to evaluate the effect of local cold application in the early post-episiotomy period on wound healing, pain level, and postpartum comfort.

MATERIALS AND METHODS

Ethical Considerations: Balıkesir University Faculty of Medicine Clinical Research Ethics Committee (Date: 24.02. 2021, decision no: 2021/48). Permission to conduct the research was obtained from the Balıkesir Provincial Health Directorate (Date:06.05.2021, decision no:140570260). The purpose of the study was explained to the women, and written informed consent was obtained.

Type of Research: The research is quasi-experimental. The research process is shown with the CONSORT flow diagram (Figure 1).[11]

Hypotheses

H_1: REEDA scores decrease more over time among women who receive cold gel pad application after episiotomy than among women who receive routine postpartum care.

H_2: VAS scores decrease more over time among women who receive cold gel pad application after episiotomy than among women who receive routine postpartum care.

H_3: At the second-hour assessment, postpartum comfort scores are higher among women who receive cold gel pad application after episiotomy than among women who receive routine postpartum care.

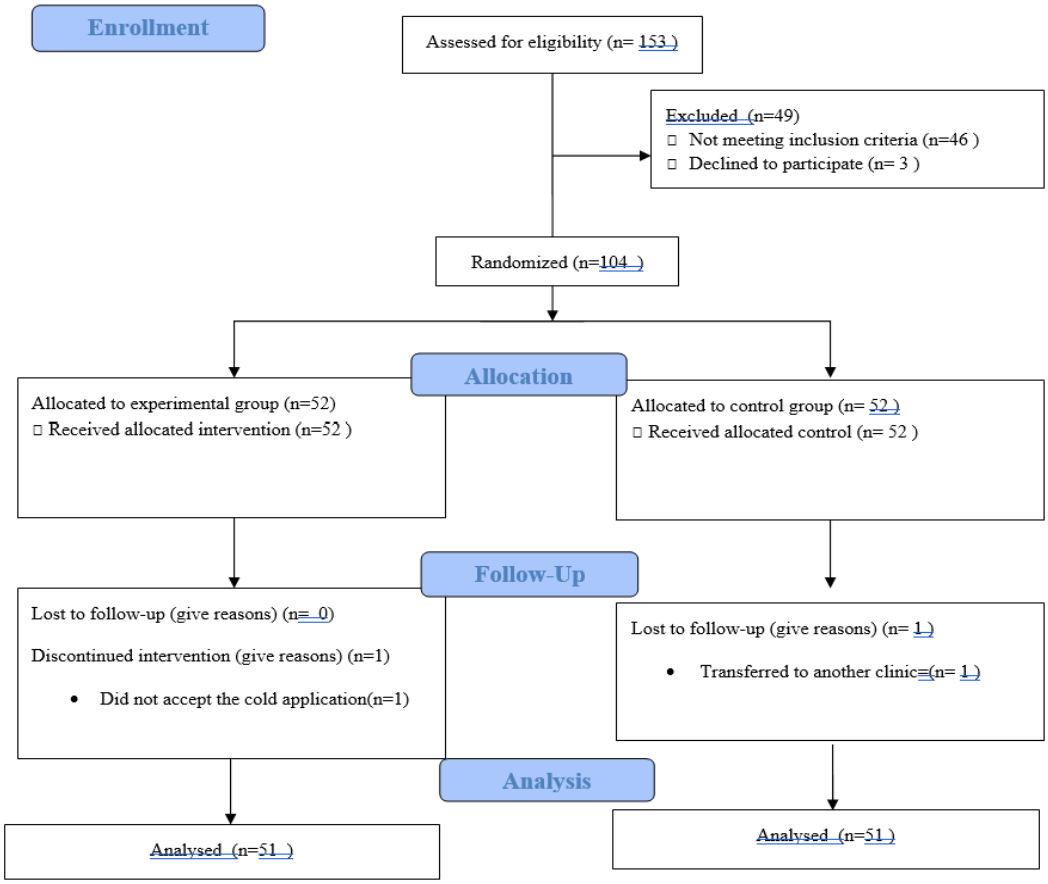


Figure 1. CONSORT flowchart.

The Population and Sample of the Study: The study population consisted of women who gave birth in the maternity ward of a city hospital between July 2021 and February 2022. The required sample size was calculated using G*Power version 3.1.9.4.[12] An a priori power analysis was performed for a repeated-measures ANOVA with a within–between interaction, assuming a medium effect size (f=0.25), a significance level of α=0.05, and a prespecified statistical power of 0.95 (β=0.05).[13] The minimum required sample size was calculated as 44 participants. To increase the robustness and precision of the findings and to compensate for potential participant loss, 102 women (51 in the experimental group and 51 in the control group) who met the inclusion criteria and voluntarily agreed to participate were enrolled in the study. Participants were numbered in the order of enrollment and randomly assigned to two groups using a random number sequence generated on random.org. The randomization process was conducted by a person independent of the researcher to prevent potential bias. Data collection commenced after group assignments were completed. This study was not registered in a clinical trial registry.

The inclusion criteria consisted of being 18 years of age or older, voluntarily agreeing to participate in the study, having a cephalic presentation with an episiotomy between 37 and 42 weeks of gestation, experiencing a singleton vaginal birth, reporting perineal pain after delivery, and having no sensory impairments (such as hearing or speech limitations) or any consciousness or psychiatric disorders that could hinder communication. Women who used analgesic or antipyretic medications, had anal sphincter tears, or had abnormal birth outcomes such as stillbirth were excluded from the study.

Data Collection Tools: Data were collected through face-to-face interviews with the participants using the Individual Identification Form (IIF), REEDA Scale, the Visual Analogue Scale (VAS), and the Postpartum Comfort Questionnaire (PCQ).

Individual Identification Form **(*IIF):*** It is a form developed by the researcher using the literature,[4,8,14] which inquires about sociodemographic characteristics and obstetric characteristics. The form included questions on age, educational status, duration of marriage, gestational age, number of pregnancies, number of births, duration of labor, infant birth weight, head circumference, episiotomy incision length, social security status, smoking during pregnancy, history of complications in previous births, induction use, and the presence of lacerations.

Redness, Edema, Ecchymosis, Discharge and Approximation (REEDA) Scale: The REEDA Scale, developed by Davidson, had its validity and reliability established by Hill, and it was adapted into Turkish by Ustunsoz.[15-17] It consists of factors indicating perineal wound healing: redness, edema, ecchymosis, discharge, and approximation. Each factor is evaluated by assigning scores of 0, 1, 2, and 3. The REEDA score ranges from 0 to 15, with higher scores indicating increased perineal trauma.

Visual Analogue Scale (VAS): It is a scale on which the patient can mark their own pain on a ten-centimeter ruler with no pain at the left end and the most severe pain (unbearable pain) that could occur at the right end.[18]

Postpartum Comfort Questionnaire **(*PCQ):*** The Scale developed by Karakaplan and Yıldız to concretely assess the postpartum physical, psychospiritual, and sociocultural comfort of mothers who have given birth consists of 34 items and a five-point Likert scale with three subscales (Physical Comfort, Psychospiritual Comfort, and Sociocultural Comfort). Items 1, 2, 4, 6, 8, 11, 12, 13, 14, 16, 17, 21, 24, 26 of the scale constitute the Physical Comfort sub-dimension; items 5, 7, 10, 15, 18, 19, 20, 23, 25, 31 constitute the Psychospiritual Comfort sub-dimension; items 3, 9, 22, 27, 28, 29, 30, 32, 33, 34 constitute the Sociocultural Comfort sub-dimension. The minimum score on the scale is 34, and the maximum is 170. As the PCQ score increases, postpartum comfort also increases. The Cronbach's Alpha value was 0.78 in the scale's development study and 0.802 in this study.[19]

Study Procedure: The study was conducted between July 2021 and February 2022 with individuals who applied to the maternity ward of a city hospital. Cold application is not routinely performed on women who undergo episiotomy at the hospital. Women undergo the intrapartum process in single rooms. During data collection, some participants were excluded from the study for various reasons. One participant changed the clinic during the follow-up period, and one participant did not accept the cold application. These participants were not included in the final analysis.

Experimental Group: Immediately after delivery (0 hour), IIF, REEDA, and VAS assessments were performed. The intervention consisted of two consecutive cycles. In the first cycle, a cold gel pad was applied for 20 minutes, followed by a 10-minute rest period, after which a new cold gel pad was applied for an additional 20 minutes. One hour after the first application, the mother was positioned in the lithotomy position, and REEDA and VAS assessments were repeated. The second cycle was then performed using the same protocol: a 20-minute cold gel pad application, a 10-minute rest period, and a second 20-minute cold gel pad application. Two hours after the first application, REEDA, VAS, and PCQ assessments were performed. Thus, each participant received a total of four 20-minute cold gel pad applications separated by three 10-minute rest intervals. Cold gel pad packages wrapped in sterile gauze to prevent direct skin contact were placed over the episiotomy incision line. No side effects related to the cold gel pad application were observed. The duration of each cold gel pad application (20 minutes) and the timing of outcome assessments were determined based on previous studies evaluating postpartum perineal cryotherapy.[4,9]

Control Group: Immediately after delivery (0 hour), IIF, REEDA and VAS assessments were administered. At the end of the first hour, REEDA and VAS assessments were repeated. At the end of the second hour, REEDA, VAS, and PCQ were administered, and all measurements were completed.

Risk of Bias: In this study, group assignments were conducted by an individual independent of the researcher. The data collection process was conducted by members of the research team working in the delivery room in accordance with the standard study protocol. The similarity in the groups' baseline sociodemographic and obstetric characteristics reduced the risk of selection bias. However, due to the nature of the intervention, it was not possible to blind the participants or data collectors. Furthermore, the fact that the study was conducted at a single center may limit the generalizability of the findings.

Statistical Analysis: Data were analyzed using IBM SPSS Statistics version 26.0. Descriptive statistics were expressed as mean ± SD, frequencies, and percentages. The normality of continuous variables was assessed using the Shapiro-Wilk test and skewness and kurtosis values. Skewness and kurtosis values between -1 and +1 were considered indicative of an approximately normal distribution. If the normality assumption was met, the difference between the means of two groups was evaluated using Student's t-test; otherwise, the Mann-Whitney U test was used. Differences between categorical variables were compared using the Chi-square test and Fisher's exact test.

Changes in REEDA and VAS scores over time were analyzed using a two-way mixed analysis of variance (Mixed ANOVA), with group (experimental/control) as the between-subject factor and time (baseline, 1 hour, and 2 hours) as the within-subject factor. The primary parameter of interest was the group×time interaction. Mauchly's test was used to assess the sphericity assumption, and Greenhouse–Geisser corrected results were reported when the assumption was violated. Bonferroni-adjusted pairwise comparisons were performed for post hoc analyses. PCQ scores, assessed only at the 2-hour follow-up, were compared between groups using the independent samples Student's t-test. Effect sizes were reported as partial eta squared (partial η^2). Statistical significance was set at $p<0.05$.

RESULTS

The experimental and control groups were comparable in terms of baseline demographic and obstetric characteristics. The mean age was 25.21±3.85 and 26.13±4.49 years (p=0.269), duration of marriage was 3.39±3.25 and 4.02±3.53 years (p=0.346), gestational age was 39.35±0.97 and 39.15±1.84 weeks (p=0.504), number of pregnancies was 1.35±0.55 and 1.50±0.67 (p=0.204), and number of births was 1.27±0.49 and 1.47±0.57 (p=0.068) in the experimental and control groups, respectively. No significant between-group differences were observed in duration of labor (p=0.382), infant birth weight (p=0.206), infant head circumference (p=0.351), or episiotomy incision (p=0.271). Likewise, educational status (p=0.928), social security (p=0.183), smoking during pregnancy (p=0.084), history of complications in previous births (p=1.000), use of labor induction (p=0.650), and presence of lacerations (p=0.362) did not differ significantly between groups (Table 1).

Table 1. Baseline demographic and obstetric characteristics of the experimental and control groups (n=102).

Parameters		**Experimental group**	**Control group**	**p**
Age (years), Mean±SD		25.21±3.85	26.13±4.49	0.269*
Duration of marriage, Mean±SD		3.39±3.25	4.02±3.53	0.346*
Gestational age (weeks), Mean±SD		39.35±0.97	39.15±1.84	0.504*
Number of pregnancies, Mean±SD		1.35±0.55	1.50±0.67	0.204*
Number of births, Mean±SD		1.27±0.49	1.47±0.57	0.068*
Duration of labor (hours), Mean±SD		4.20±2.12	3.85±1.93	0.382*
Birth weight of the baby (g), Median (Min-Max)		3180(2440-4300)	3340(2210-4080)	0.206**
Head circumference of the baby (cm), Mean±SD		35.05±0.85	34.90±0.83	0.351*
Size of the episiotomy incision (cm), Median (Min-Max)		3 (2-6)	3 (1-5)	0.271**
Educational status, n **(%)**	Literate	2 (3.9)	1 (2.0)	0.928***
	Primary school	13 (25.5)	15 (29.4)	
	High school	16 (31.4)	14 (27.5)	
	University and above	20 (39.2)	21 (41.2)	
Social security, n (%)	Yes	44 (86.3)	48 (94.1)	0.183****
	No	7 (13.7)	3 (5.9)	
Smoking during pregnancy, n (%)	Yes	4 (7.8)	10 (19.6)	0.084****
	No	47 (92.2)	41 (80.4)	
History of complications in previous births, n (%)	Yes	1 (7.7)	3 (12.5)	1.000***
	No	12 (92.3)	21 (87.5)	
Use of induction, n (%)	Yes	37 (72.5)	39 (76.5)	0.650****
	No	14 (27.5)	12 (23.5)	
Presence of lacerations, n (%)	Yes	4 (7.8)	1 (2.0)	0.362***
	No	47 (92.2)	50 (98.0)	

n: Count; %: Percentage; Min: Minimum; Max: Maximum; SD: Standard deviation; *: Student's t test; **: Mann Whitney U test; ***: Fisher's Exact Test; ****: Chi square test; p: p value; p<0.05 is considered statistically significant.

A two-way mixed analysis of variance (Mixed ANOVA) was performed to evaluate changes in REEDA and VAS scores over time between the experimental and control groups. For REEDA scores, Mauchly's test indicated that the assumption of sphericity was violated (p<0.001). REEDA scores decreased from 1.82±1.33 at baseline to 0.71±1.14 at 1 hour and 0.27±0.60 at 2 hours in the experimental group, whereas the corresponding scores in the

control group were 1.53±0.78, 1.45±1.12, and 1.25±1.29, respectively. VAS scores decreased from 2.76±2.44 to 1.24±1.18 and 0.53±0.90 in the experimental group, while they were 2.59±1.91, 2.49±1.90, and 2.25±1.92 in the control group. Significant group×time interactions were observed for both REEDA ($p<0.001$, partial $\eta^2=0.145$) and VAS ($p<0.001$, partial $\eta^2=0.264$), indicating greater reductions over time in the experimental group. These temporal changes in REEDA and VAS scores are illustrated in Figure 2, whereas the descriptive statistics and mixed ANOVA results are presented in Table 2.

Table 2. Changes in REEDA and VAS scores over time according to study groups: Results of the two-way mixed ANOVA (n=102).

Outcome	Group	0 hour	1 hour	2 hours	Time (GG corrected) F(p)	Group F (p)	Group × Time (GG corrected) F(p)	Interaction partial η²
REEDA	**Experimental**	1.82±1.33[a]	0.71±1.14[b]	0.27±0.60[c]	31.694	8.251	16.985	0.145
	Control	1.53±0.78[a]	1.45±1.12[a]	1.25±1.29[a]	(<**0.001**)	(0.005)	(<**0.001**)	
VAS	**Experimental**	2.76±2.44[a]	1.24±1.18[b]	0.53±0.90[c]	61.887	8.203	35.962	0.264
	Control	2.59±1.91[a]	2.49±1.90[a]	2.25±1.92[b]	(<**0.001**)	(0.005)	(<**0.001**)	

a, b, c: Different superscript letters indicate statistically significant differences between time points within the same group according to Bonferroni-adjusted pairwise comparisons ($p<0.05$); REEDA: Redness, Edema, Ecchymosis, Discharge, Approximation; VAS: Visual Analog Scale; F: F statistic; p: p value; GG: Greenhouse–Geisser correction; η^2: partial eta squared; SD: standard deviation.

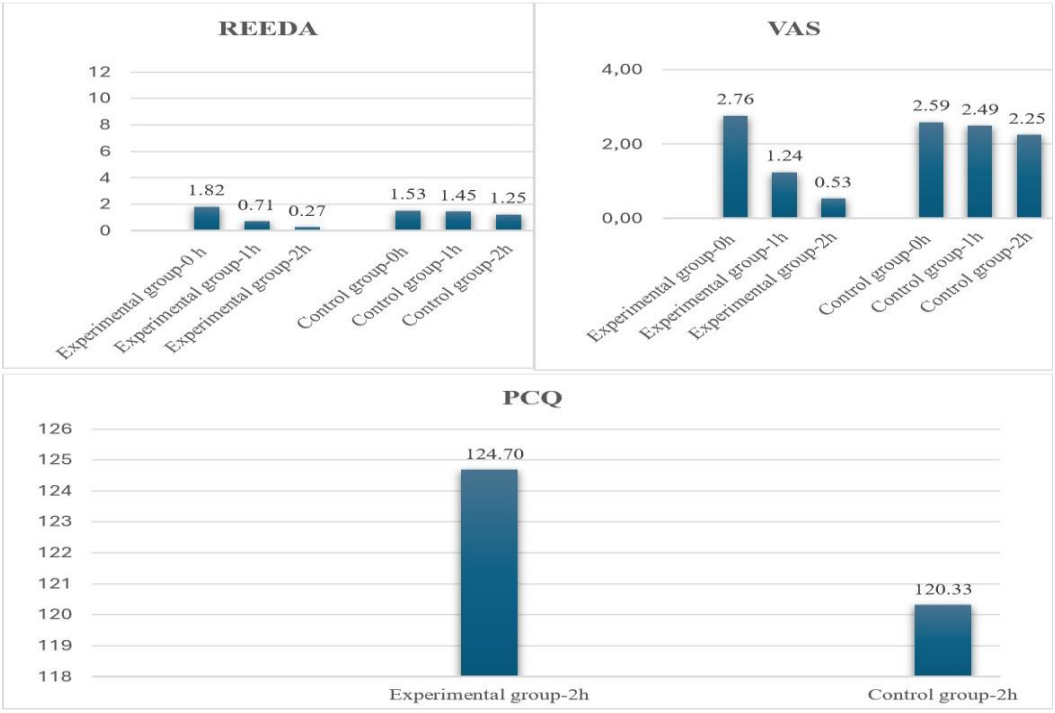


Figure 2. Changes in REEDA, VAS and PCQ scores over time in the experimental and control groups.
REEDA: Redness, Edema, Ecchymosis, Discharge, Approximation; VAS: Visual Analog Scale; PCQ: Postpartum Comfort Questionnaire.

As REEDA and VAS outcomes were evaluated using a two-way mixed ANOVA (Table 2), only postpartum comfort outcomes measured at the 2-hour follow-up were compared between groups using Student's t-test. The experimental group demonstrated significantly higher total PCQ scores than the control group ($p=0.011$). Psychospiritual Comfort ($p=0.025$) and Sociocultural Comfort ($p=0.015$) subscale scores were also significantly

higher in the experimental group, whereas no significant difference was observed in the Physical Comfort subscale (p=0.088) (Table 3).

Table 3. Comparison of postpartum comfort questionnaire scores between the experimental and control groups at the 2-hour assessment (n=102).

Outcome	Experimental	Control	p
PCQ Total, Mean±SD	124.70±8.20	120.33±8.74	**0.011***
Physical Comfort, Mean±SD	49.41±4.13	48.09±3.53	0.088*
Psychospiritual Comfort, Mean±SD	43.64±3.88	41.88±3.95	**0.025***
Sociocultural Comfort, Mean±SD	31.64±2.59	30.35±2.65	**0.015***

PCQ: Postpartum Comfort Questionnaire; SD: Standard deviation; *: Student's t test.

DISCUSSION AND CONCLUSION

The findings suggest that using a cold gel pad may be a useful non-pharmacological intervention in early post-episiotomy care. The experimental and control groups had comparable baseline demographic and obstetric characteristics. The two-way mixed ANOVA showed significant main effects of both time and group on REEDA scores, as well as a significant interaction effect. This interaction indicates that the reduction in REEDA scores over time was significantly greater in the experimental group than in the control group. Bonferroni-adjusted comparisons further demonstrated that REEDA scores decreased significantly across all three measurements in the experimental group, whereas no significant within-group change was observed in the control group. The reduction in REEDA scores suggests an improvement in early perineal wound findings. This finding is consistent with the emphasis by Solt Kirca et al. that cold application limits edema and tissue damage by reducing signs of inflammation.[4] Kim et al. reported in their systematic review and meta-analysis that cryotherapy may reduce postpartum perineal pain.[8] A quasi-randomized controlled study conducted in Taiwan reported that cold gel pad application significantly reduced post-episiotomy perineal pain and improved women's satisfaction with pain management.[14] Similarly, the mixed ANOVA demonstrated significant main effects of time and group for pain intensity, together with a significant group×time interaction. These findings indicate that pain intensity decreased significantly more over time in the experimental group than in the control group. Bonferroni-adjusted comparisons showed progressive reductions in pain at each assessment in the experimental group, whereas only a slight decrease was observed at the second-hour assessment in the control group. In the control group, the VAS score did not show a significant difference between the pre-intervention assessment (0 hour) and the first post-intervention assessment (1 hour), whereas a statistically significant decrease was observed at the second post-intervention assessment (2 hours). Cold application may be considered an effective non-pharmacological intervention to reduce pain after an episiotomy and can be incorporated into routine midwifery and nursing practice.[4,20,21]

In evaluations based on VAS score averages, a significant decrease in pain levels was observed in the experimental group, and this decrease persisted through the 2-hour assessment. This result supports the analgesic effect of applying a cold gel pad. The literature indicates that cold application reduces pain.[9,20] Similarly, a randomized controlled trial conducted in Egypt reported that the early application of an ice gel pad during the postpartum period reduced perineal pain and improved perineal wound healing within the first 24 hours.[22] Luxey et al. also found in their systematic review that postpartum ice application is important for pain management, supporting our study.[23]

Postpartum perineal pain limits mothers' daily activities and their ability to care for their babies and reduces their comfort.[4] At the 2-hour assessment, total PCQ, psychospiritual comfort, and sociocultural comfort scores were significantly higher in the experimental group, whereas physical comfort scores did not differ significantly between groups. The increase in comfort levels suggests that cold application contributes not only to physiological well-being but also to psychosocial well-being. In Birgili's study,[24] the sociocultural comfort subscale scores of women who had vaginal births were similar to those in our study, whereas the physical and psychospiritual comfort subscale scores were lower. The improvement in postpartum comfort observed in the present study is consistent with the findings of Şenol and Aslan, who reported that applying a cold gel pad significantly increased postpartum comfort in women following vaginal birth.[25] This may be due to differences in the physical conditions of the hospital where the birth took place and the individuals providing care services.

This study is limited because the intervention was evaluated only during the early postpartum period; long-term outcomes, such as wound healing, scar formation, and sexual function, were not assessed. Pain and comfort

measures relied on subjective self-reports, which may have been affected by individual perceptual differences. Future research should compare various types, timings, and durations of cold applications (e.g., perineal cryo-sleeve) and incorporate objective indicators, including biochemical markers of inflammation. In addition, postpartum comfort was assessed only once after the intervention; therefore, temporal changes in comfort could not be evaluated using repeated-measures methods.

In conclusion, this study demonstrated that changes in REEDA and VAS scores over time differed significantly between the experimental and control groups. Early application of a cold gel pad resulted in greater reductions in REEDA and pain scores than routine postpartum care. At the 2-hour assessment, total PCQ, psychospiritual comfort, and sociocultural comfort scores were higher in the experimental group, whereas physical comfort did not differ significantly. Cold gel pad application may therefore be considered a non-pharmacological option in early post-episiotomy care. Further multicenter studies with longer follow-up periods are needed.

Ethics Committee Approval: Balıkesir University Faculty of Medicine Clinical Research Ethics Committee (Date: 24.02. 2021, decision no: 2021/48). Permission to conduct the research was obtained from the Balıkesir Provincial Health Directorate (Date:06.05.2021, decision no:140570260). The purpose of the study was explained to the women, and written informed consent was obtained.

Conflict of Interest: No conflict of interest was declared by the authors.

Author Contributions: Concept – EC; Supervision – EC; Materials – EC; Data Collection and/or Processing – EC, SC, HK, DK, ST; Analysis and/or Interpretation – EC; Writing – EC, SC, HK, DK, ST.

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REFERENCES

1. Dharmasiri ADU, De Silva DKM, Madhavi AVP. Assessing the quality of life of postpartum mothers with episiotomy in the first six post-partum weeks: a descriptive cross-sectional study. BMC Pregnancy Childbirth. 2025;25(1):522. doi:10.1186/s12884-025-07645-6
2. Ghulmiyyah L, Sinno S, Mirza F, Finianos E, Nassar AH. Episiotomy: history, present and future-a review. J Matern Fetal Neonatal Med. 2022;35(7):1386-1391. doi:10.1080/14767058.2020.1755647
3. Gondim EJL, do Nascimento SL, Gaitero MVC, de Mira TAA, Surita FG. Non-pharmacological interventions for perineal trauma in the postpartum period: a scoping review. Midwifery. 2025;144:104341. doi:10.1016/j.midw.2025.104341
4. Solt Kirca A, Korkut Oksuz S, Murat N. The effect of cold application on episiotomy pain: A systematic review and meta-analysis. J Clin Nurs. 2022;31:559-568. doi:10.1111/jocn.15912
5. Augustino J, Moshi F, Joho A, Mageda K. The effectiveness of perineal cold pack application on postpartum perineal pain and timely breastfeeding initiation among women after spontaneous vaginal delivery in Dodoma region: A randomized control clinical trial (RCCT) research protocol. Medicine: Case Reports and Study Protocols. 2024;5(1):e00308. doi:10.1097/MD9.0000000000000308
6. Bilgin Z, Komurcu N. Uterus masajlarının kadınların postpartum ağrı şiddetini algılamasındaki etkisi. Zeynep Kamil Tıp Bülteni. 2016;47(2):39-44. doi:10.16948/zktb.86700
7. T.C. Sağlık Bakanlığı. Ebelik Yönetmeliği. Resmî Gazete. https://www.mevzuat.gov.tr/mevzuat?MevzuatNo=41084&MevzuatTur=&MevzuatTertip=5. Accessed June 20, 2026.
8. Kim H-J, An J-W, Lee Y, Shin Y-S. The effects of cryotherapy on perineal pain after childbirth: A systematic review and meta-analysis. Midwifery. 2020;89:102788. doi:10.1016/j.midw.2020.102788
9. East CE, Dorward ED, Whale RE, Liu J. Local cooling for relieving pain from perineal trauma sustained during childbirth. Cochrane Database Syst Rev. 2020(10). doi:10.1002/14651858.cd006304.pub4
10. Suvarna RR, Chippala P. Effect of ice pack on pain and activities of daily living after episiotomy: A randomised controlled trial. J Clin Diagn Res. 2023;17(10):1-4. doi:10.7860/jcdr/2023/65320.18619
11. Schulz KF, Altman DG, Moher D; CONSORT Group. CONSORT 2010 statement: updated guidelines for reporting parallel group randomized trials. Ann Intern Med. 2010;152(11):726-732. doi:10.7326/0003-4819-152-11-201006010-00232

12. Faul F, Erdfelder E, Lang AG, Buchner A. G*Power 3: A flexible statistical power analysis program for the social, behavioral, and biomedical sciences. Behav Res Methods. 2007;39(2):175-191. doi:10.3758/BF03193146
13. Kang H. Sample size determination and power analysis using the G*Power software. Educ Eval Health Prof. 2021;18:17. doi:10.3352/jeehp.2021.18.17
14. Lu Y-Y, Su M-L, Gau M-L, Lin K-C, Au H-K. The efficacy of cold-gel packing for relieving episiotomy pain-a quasi-randomised control trial. Contemp Nurse. 2015;50(1):26-35. doi:10.1080/10376178.2015.1010257
15. Davidson N. REEDA: evaluating postpartum healing. J Nurse Midwifery. 1974;19(2):6-8. doi:10.1111/j.1542-2011.1974.tb00384.x
16. Hill PD. Effects of heat and cold on the perineum after episiotomy/laceration. J Obstet Gynecol Neonatal Nurs. 1989;18(2):124-129. doi:10.1111/j.1552-6909.1989.tb00475.x
17. Ustunsoz A. Epizyotomi iyileşmesinde sıcak ve soğuk uygulamaların etkisi. Ankara: GATA Sağlık Bilimleri Enstitüsü. Yayınlanrnamış Yüksek Lisans Tezi. Ankara. 1996.
18. Eti Aslan F. Ağrı: Doğası ve kontrolü. In: Eti Aslan F, editor. Ağrı değerlendirilmesi ve ölçümü: İstanbul Medikal Yayıncılık; 2006.
19. Karakaplan S, Yıldız H. Doğum sonu konfor ölçeği geliştirme çalışması. Maltepe Üniversitesi Hemşirelik Bilim ve Sanatı Dergisi. 2010;3(1):55-65
20. Karim KK, Gan F, Hong J, Hamdan M, Razali N, Tan PC. Cold compared with room temperature compress on the repaired primiparous perineum following injury at normal vaginal delivery: a randomized controlled trial. Am J Obstet Gynecol MFM. 2024;6(2):101271. doi:10.1016/j.ajogmf.2023.101271
21. Tomaz RGDO, Brito APA, Riesco MLG. Implementation of evidence-based practices in the perineal pain management in the postpartum period. Rev Bras Enferm. 2022;75(2):e20210084. doi:10.1590/0034-7167-2021-0084
22. Ali Mohamed MY, Shaban HTE, Ramadan AG. Effect of ice gel pad application on early postpartum perineal trauma outcomes: A randomized controlled trial. Int Egypt J Nurs Sci Res. 2024;4(2):360-375. doi:10.21608/ejnsr.2024.258873.1346
23. Luxey X, Lemoine A, Dewinter G, Joshi GP, Le Ray C, Raeder J, et al. Acute pain management after vaginal delivery with perineal tears or episiotomy. Reg Anesth Pain Med. 2025;50(6):503-513. doi:10.1136/rapm-2024-105478
24. Birgili F. Doğum yapan kadınların doğumsonu konforu ve etkileyen faktörler. J Anatolia Nurs Health Sci. 2020;23(3):351-360. doi:10.17049/ataunihem.484941
25. Senol DK, Aslan E. The effects of cold application to the perineum on pain relief after vaginal birth. Asian Nurs Res. 2017;11(4):276-282. doi:10.1016/j.anr.2017.11.001