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Frequency and Severity of Perineal Tears among Women during Vaginal Delivery at a Tertiary Care Hospital

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ABSTRACT

Background: Perineal tears are among the most common complications of vaginal delivery, with potential consequences for maternal morbidity, quality of life, and mode of delivery in subsequent pregnancies. Understanding their frequency, severity, and determinants is crucial for tailoring preventive and management strategies in tertiary care settings. **Objective:** To determine the frequency and severity of perineal tears among women undergoing vaginal delivery at a tertiary care hospital and to identify maternal and intrapartum factors contributing to their occurrence. **Methodology:** This cross-sectional study was conducted in the Department of Obstetrics and Gynaecology, Peoples University of Medical & Health Sciences, Nawabshah, over six months, from April, 2024 to October, 2024. A total of 108 women aged 18–40 years with singleton pregnancies between 28–40 weeks of gestation were included through non-probability consecutive sampling. Data on demographics, parity, body mass index (BMI), gestational age, mode of delivery, and perineal outcomes were recorded. Perineal tears were classified into first, second, third, and fourth degrees. Data were analysed using SPSS version 25, with chi-square tests applied to assess associations ($p \leq 0.05$). **Results:** The overall frequency of perineal tears was 13.9%, predominantly first- and second-degree tears. A significant association was observed between higher BMI and risk of perineal tears ($p = 0.0308$). Parity, age, mode of delivery, and gestational age showed non-significant trends. **Conclusion:** Perineal tears remain an important maternal health concern, with obesity emerging as a key determinant. These findings highlight the need for preventive strategies such as perineal protection techniques, weight optimisation, and skilled intrapartum care. Future multicentre studies with larger sample sizes and long-term follow-up are warranted to better address complications and refine guidelines for clinical practice and education.

INTRODUCTION

Perineal tears defined as trauma to the perineum sustained during vaginal birth remain one of the most frequent complications of spontaneous and assisted vaginal deliveries. They range from first-degree superficial lacerations to third- and fourth-degree obstetric anal sphincter injuries (OASIs), with the latter associated with significant long-term morbidity.[1,2] Consequences include pain, infection, wound breakdown, dyspareunia, urinary and fecal incontinence, and psychological distress.[3,4] Beyond the immediate postpartum period, women with severe tears may experience lasting impairment in quality of life, and clinicians often recommend or women themselves prefer caesarean delivery in subsequent pregnancies due to fear of recurrence or functional loss.[3,5]

Globally, the burden of perineal trauma varies widely. A systematic review across low- and middle-income countries (LMICs) reported pooled rates of episiotomy of ~46%, second-degree tears of ~24%, and OASIs of ~1.4%, with substantial heterogeneity.[6] Population-based cohorts in high-income countries have demonstrated rising OASI rates over time, partly due to improved detection and reporting.[7,8] Risk factors consistently identified include primiparity, instrumental delivery (forceps, vacuum), higher birth weight, prolonged second stage of labour, and midline episiotomy.[9,10] A recent Ethiopian case–control study confirmed many of these predictors in an LMIC setting, emphasizing that severe perineal trauma is not restricted to high-income countries.[12]

In Pakistan, hospital-based research has highlighted a notable prevalence of perineal tears. At Countess Lady Duffrin Fund Hospital, Hyderabad, the frequency was 9.8% among 1,488 vaginal births, with significant associations with primiparity, oxytocin use, forceps delivery, mediolateral episiotomy, and birth weight >3.6 kg.[1] At Liaquat University of Medical & Health Sciences (LUMHS),

Jamshoro, retrospective studies have reaffirmed the predominance of first- and second-degree tears, and identified risk from primigravidity, induced labour, and deliveries conducted by less-experienced providers.[2] In Multan, a cross-sectional study similarly documented frequent perineal trauma of varying severity.[3] More recent work from Khyber Pakhtunkhwa reported OASI in 3.9% of nulliparous women delivering vaginally at a tertiary hospital, keeping the issue in focus.[4]

The implications of severe perineal tears extend far beyond the delivery room. Systematic reviews and long-term cohort studies demonstrate that women with OASI face substantially higher risks of persistent anal incontinence, especially following fourth-degree injury.[9,11,13] Moreover, recurrence of OASI in subsequent births is a well-established risk, complicating counselling around mode of delivery in later pregnancies.[10,11] International guidelines, such as the Royal College of Obstetricians and Gynaecologists (RCOG) Green-top 29, therefore emphasise accurate classification, meticulous repair, and structured follow-up.[8]

While Pakistani studies provide important insights into perineal tear prevalence, many are limited by their focus on either selected exposures or specific subsets such as OASI. Few have comprehensively assessed both frequency and severity of all perineal tears in a tertiary-care setting, analysed predictors spanning maternal, fetal, and intrapartum domains, and linked these outcomes to implications for future deliveries and women's quality of life. Addressing this gap is vital for developing context-appropriate preventive strategies, including episiotomy policy, perineal protection techniques, selective use of instruments, and structured postnatal counselling and follow-up.

Research Question

What is the frequency and severity of perineal tears among women undergoing vaginal delivery at a tertiary care hospital in Pakistan, and what maternal, fetal, and labour-related factors are associated with severe tears?

Objectives

1. To estimate the overall frequency of perineal tears among vaginal deliveries.
2. To classify the severity of tears and determine their distribution.
3. To identify maternal, fetal, and intrapartum predictors of severe perineal trauma.

METHODOLOGY

Study Design

This was a hospital-based cross-sectional study conducted at the Department of Obstetrics and Gynaecology, Peoples University of Medical & Health Sciences (PUMHS), Nawabshah.

Study Duration

The study was carried out over a period of six months, from April, 2024 to October, 2024.

Sample Size and Sampling

A sample size of 108 cases was calculated using a single-proportion formula with a 95% confidence level, 5% margin of error, and an expected frequency of perineal tears of 7.55% based on previous local literature.[1] A non-probability consecutive sampling technique was employed to recruit participants

Eligibility Criteria

Women aged 18–40 years with singleton pregnancies between 28–40 weeks of gestation, either primigravida or multigravida, presenting in active labour and willing to provide written informed consent were included in the study. Women were excluded if they underwent instrumental deliveries complicated by shoulder dystocia, had breech presentation, intrauterine fetal death or abortion confirmed by ultrasound/fetal cardiotocography, congenital or acquired abnormalities affecting perineal anatomy (such as previous pelvic surgery or genital tract anomalies), severe obstetric complications that could confound assessment of perineal tear severity, as well as those with preterm delivery, multiple gestation, antepartum haemorrhage, or any other effect modifiers.

Data Collection and Variables

After approval from the ethical review committee and CPSP, eligible women presenting to the labour room who met inclusion criteria were enrolled consecutively after obtaining written informed consent. Demographic details including age, parity, body mass index (BMI), and gestational age were recorded on a structured proforma. Following delivery, a systematic examination of the perineum, vulva, vagina, and cervix was performed under sterile conditions and adequate lighting to detect and classify perineal tears into first, second, third, or fourth degree according to standard definitions. Management was provided according to severity, and relevant laboratory investigations (haemoglobin, complete blood count, coagulation profile, urine analysis, blood grouping and Rh typing, and cultures when indicated) were carried out in the same institutional laboratory to minimise bias. The independent variables included maternal age, parity, BMI, gestational age, and mode of delivery (spontaneous or assisted), while the dependent variable was the presence and severity of perineal tears.

Data Analysis

Data was entered and analysed in SPSS v25. Continuous variables (maternal age, gestational age, BMI) were summarised as mean ± SD, and categorical variables (parity, mode of delivery, presence and grade of perineal tear) as frequencies and percentages. To control effect modifiers, data were stratified by maternal age, gestational age, parity (primigravida/multigravida), and mode of delivery (spontaneous/assisted). Post-stratification chi-square tests were applied to compare categorical outcomes, with a two-tailed $p \leq 0.05$ considered statistically significant.

RESULTS

The study included 108 women. The mean maternal age, gestational age, and BMI are summarised below, along with parity and mode of delivery distribution. Overall perineal tear rate is also presented.

Table 1

Participant demographics and overall perineal tear rate.

Variable	Value
Age_mean_sd	27.0 ± 4.6
GA_mean_sd	38.3 ± 1.2
BMI_mean_sd	27.2 ± 3.9

Primiparous_n_%	59 (54.6%)
Multiparous_n_%	49 (45.4%)
Instrumental_n_%	13 (12.0%)
Spontaneous_n_%	95 (88.0%)
Tear_n_%	15 (13.9%)

Frequency and Severity of Perineal Tears

Perineal tears occurred in 13.9% of women. Among those with tears, first- and second-degree tears predominated, with no case of third- and fourth-degree injuries. The grade distribution is shown in Table 2 and Figure 1.

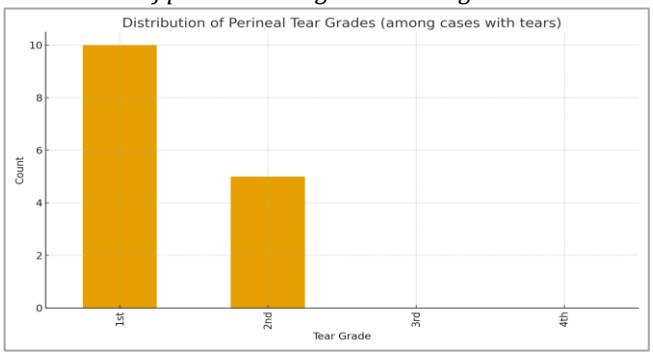
Table 2

Distribution of perineal tear grades (among cases with tears).

Grade	Count	Percent
1st	10	66.7
2nd	5	33.3
3rd	0	0.0
4th	0	0.0

Figure 1

Distribution of perineal tear grades among cases with tears.



Factors Associated with Perineal Tears

Chi-square analyses explored associations between perineal tears and maternal, fetal, and labour-related factors. Results are summarised in Table 3. A significant association was found with BMI group (p = 0.0308), while parity, mode of delivery, age group, and gestational age group showed non-significant trends. Figures 2–5 illustrate tear risks by key factors.

Table 3

Association of selected factors with perineal tears (chi-square test).

Variable	Chi-square p-value
Parity	0.8644
Mode of Delivery	0.1474
Age Group	0.6451
BMI Group	0.0308
Gestational Age Group	0.1536

Figure 2

Perineal tear rate by mode of delivery.

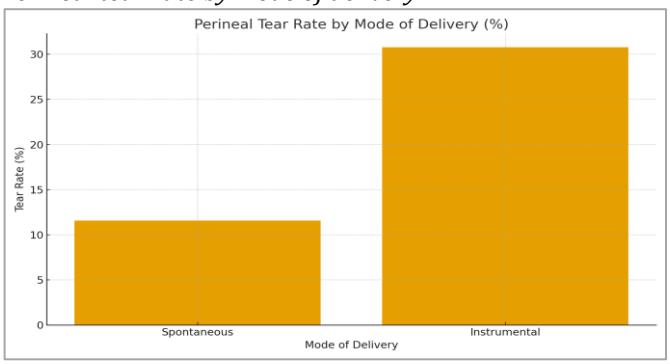


Figure 3

Perineal tear rate by parity.

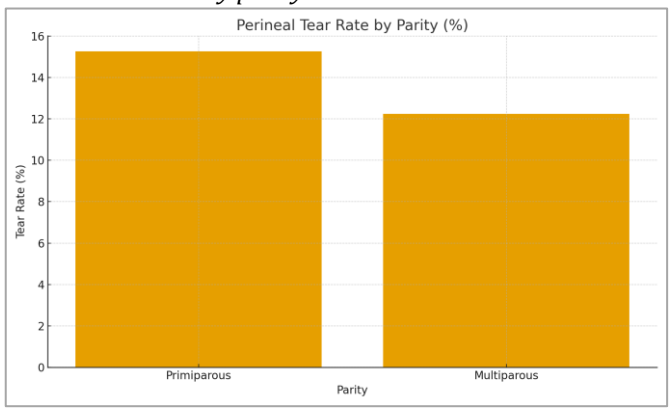


Figure 4

Perineal tear rate by BMI group.

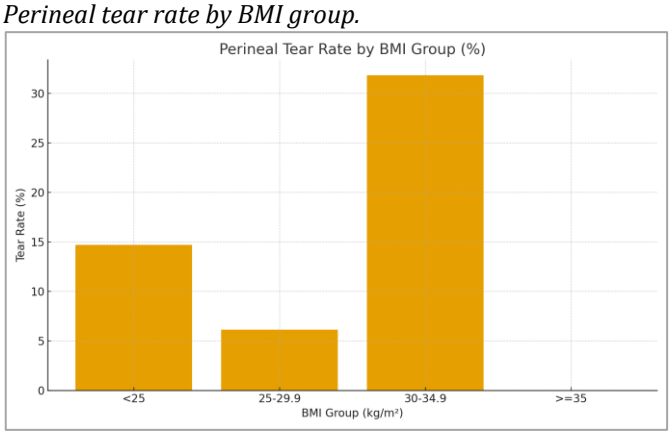
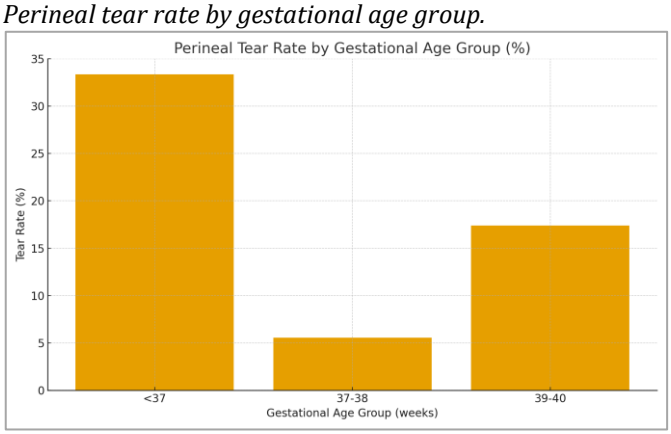


Figure 5

Perineal tear rate by gestational age group.



DISCUSSION

This study assessed the frequency and severity of perineal tears among women undergoing vaginal delivery at a tertiary care hospital. The overall frequency of perineal tears was 13.9%, which is higher than the 7.55% expected from prior local estimates,[1] suggesting either variations in population risk, clinical practice, or improved recognition of perineal trauma. Most tears were of mild severity, with first- and second-degree tears predominating, while no third- or fourth-degree obstetric anal sphincter injuries (OASIs) were identified. A significant association was observed between higher BMI and increased risk of perineal tears (p = 0.0308), while parity, maternal age, gestational age, and mode of delivery showed non-significant associations.

The frequency of perineal tears in this study (13.9%) is broadly consistent with previous Pakistani research, although reported prevalence rates vary. Brohi et al. reported a 9.8% frequency in Hyderabad,[1] while Parveen et al. noted 12.5% in Multan.[3] Our slightly higher rate may reflect differences in patient demographics, provider practices, or case ascertainment. By contrast, international studies report even higher overall perineal trauma frequencies: Aguiar et al. found perineal tears (all grades) in ~24% of deliveries across LMICs,[6] and Jansson et al. reported significant rates of both first- and second-degree tears in Scandinavian cohorts.[9] The absence of severe OASIs in our dataset diverges from international literature, where third- and fourth-degree tears are often reported at rates of 1–7%.[7],[8],[12] This may be explained by our relatively small sample size, underdiagnosis due to limited postpartum surveillance, or protective factors such as routine use of mediolateral episiotomy in high-risk cases.

We observed a statistically significant association between higher maternal BMI and increased risk of perineal tears. This finding aligns with previous reports linking obesity to reduced tissue elasticity, prolonged labour, and increased instrumental interventions, all of which predispose to trauma.[13]

Although primiparas demonstrated a slightly higher numerical risk, the association with parity was not statistically significant. Prior literature consistently identifies primiparity as a major determinant of perineal trauma due to less distensible tissues and longer second stages of labour.[9],[14] The lack of significance in our study may be due to limited power from a small sample size or confounders such as episiotomy use.

Instrumental delivery showed a trend toward higher tear rates compared to spontaneous vaginal delivery, though this did not reach statistical significance (p = 0.1474). International studies, including Gurol-Urganci et al.[7] and a systematic review by Okeahialam et al.,[11] strongly support forceps and vacuum as major risk factors for severe perineal trauma. The absence of statistical significance here may reflect the relatively low number of instrumental cases (12%).

Maternal age group was not significantly associated with tears (p = 0.6451). While some studies suggest older age increases risk due to reduced tissue elasticity, others show no effect.[15] Our findings lean toward the latter, though a larger dataset might clarify age-related risks.

Gestational age group also showed no significant association (p = 0.1536), although higher tear rates were noted at 39–40 weeks. Previous reports highlight post-term gestations and larger fetal size as risk factors.[16] The trend in our study may similarly indicate that more advanced gestation increases perineal stretch and trauma risk.

Clinical and Public Health Implications

The predominance of first- and second-degree tears highlights the importance of timely recognition and repair, which can prevent infection, chronic pelvic pain, and sexual dysfunction. The association with higher BMI underlines the need for preconception counselling on weight management and tailored intrapartum care for obese women. While OASIs were not identified, vigilance is warranted given their profound long-term sequelae, including anal incontinence and adverse quality-of-life outcomes.[5],[11] Adoption of hands-on perineal protection techniques, judicious episiotomy, and selective instrumental delivery may further mitigate risks. At a public health level, training labour ward staff to recognise and accurately classify tears is crucial to improving maternal outcomes.

Future Research

Our study exposes several gaps. Larger, multicentre studies are needed to validate associations between BMI and perineal trauma, and to better assess the role of parity, maternal age, and gestational age. Prospective designs incorporating long-term follow-up could link tear severity with outcomes such as continence, sexual health, and psychological well-being. Furthermore, evaluating the impact of preventive measures—such as perineal massage, warm compresses, and upright birthing positions—remains an area for future clinical trials, particularly in South Asian populations.

Limitations

This study is limited by its cross-sectional design, restricting causal inference. The relatively small sample size may have underpowered the detection of associations with parity, mode of delivery, and age. Lack of long-term follow-up data precluded assessment of functional complications. Finally, the study was conducted in a single tertiary hospital, limiting generalisability to broader Pakistani populations.

CONCLUSION

In summary, perineal tears occurred in 13.9% of vaginal deliveries in our cohort, predominantly of first- and second-degree severity. Higher BMI was a significant determinant, while parity, age, gestational age, and mode of delivery showed non-significant trends. These findings converge with international literature on BMI as a risk factor, but diverge in the absence of severe OASIs. Strengthening preventive strategies, improving recognition and classification, and conducting larger multicentre studies with long-term follow-up are essential steps toward reducing the burden of perineal trauma in Pakistan.

REFERENCES

1. Brohi, Z. P., Sadaf, A., Zohra, N., & Perveen, U. (2012). Frequency and severity of perineal tears in countess lady Duffrin fund hospital, Hyderabad. *JPMA-Journal of the Pakistan Medical Association*, *62*(8), 803.
2. Shaikh, F., Madhudas, C., Shaikh, N. B., Shaikh, F., Shaikh, S., & Yousfani, S. (2021). Frequency-Risk Factors and Severity of Perineal Tear. *J Liaquat Uni Med Health Sci*. https://www.lumhs.edu.pk/jlumhs/Online-First/sept1521.pdf
3. Parveen, R., Sadiq, Q., & Ali, S. (2018). Perineal tears: frequency and severity among women during vaginal delivery. *The Professional Medical Journal*, *25*(10), 1532-1536. https://doi.org/10.29309/tpmj/18.3614

4. Farooq, N., Roghani, P., Afza, N., Saleem, A., & Farooq, A. (2025). Frequency of obstetrical anal sphincter injuries in nulliparous women undergoing normal vaginal delivery in tertiary care hospital at Khyber Pakhtunkhwa. *Pakistan Journal of Health Sciences*, 241-245. https://doi.org/10.54393/pjhs.v6i3.2756
5. Jangö, H., Langhoff-Roos, J., Rosthøj, S., & Sakse, A. (2016). Mode of delivery after obstetric anal sphincter injury and the risk of long-term anal incontinence. *American Journal of Obstetrics and Gynecology*, *214*(6), 733.e1-733.e13. https://doi.org/10.1016/j.ajog.2015.12.030
6. Aguiar, M., Farley, A., Hope, L., Amin, A., Shah, P., & Manaseki-Holland, S. (2019). Birth-related perineal trauma in low- and middle-income countries: A systematic review and meta-analysis. *Maternal and Child Health Journal*, *23*(8), 1048-1070. https://doi.org/10.1007/s10995-019-02732-5
7. Gurol-Urganci, I., Cromwell, D., Edozien, L., Mahmood, T., Adams, E., Richmond, D., Templeton, A., & Van der Meulen, J. (2013). Third- and fourth-degree perineal tears among primiparous women in England 2000-2012: time trends and risk factors. *BJOG: An International Journal of Obstetrics & Gynaecology*, *120*(12), 1516-1525. https://doi.org/10.1111/1471-0528.12363
8. Royal College of Obstetricians & Gynaecologists (RCOG). Green-top Guideline No. 29: Third- and fourth-degree perineal tears—management. London: RCOG; 2015
9. Jansson, M. H., Franzén, K., Hiyoshi, A., Tegerstedt, G., Dahlgren, H., & Nilsson, K. (2020). Risk factors for perineal and vaginal tears in primiparous women – the prospective POPRACT-cohort study. *BMC Pregnancy and Childbirth*, *20*(1). https://doi.org/10.1186/s12884-020-03447-0
10. Barba, M., Bernasconi, D. P., Manodoro, S., & Frigerio, M. (2021). Risk factors for obstetric anal sphincter injury recurrence: A systematic review and meta-analysis. *International Journal of Gynecology & Obstetrics*, *158*(1), 27-34. https://doi.org/10.1002/ijgo.13950
11. Okeahialam, N. A., Wong, K. W., Thakar, R., & Sultan, A. H. (2022). The incidence of wound complications following primary repair of obstetric anal sphincter injury: A systematic review and meta-analysis. *American Journal of Obstetrics and Gynecology*, *227*(2), 182-191. https://doi.org/10.1016/j.ajog.2022.05.012
12. Addisu, D., & Fentahun, B. (2024). Risk factors associated with severe perineal tear at public hospitals in Bahir DAR town, northwest Ethiopia. *SAGE Open Medicine*, *12*. https://doi.org/10.1177/20503121241252956
13. Blomberg, M. (2014). Maternal body mass index and risk of obstetric anal sphincter injury. *BioMed Research International*, *2014*, 1-8. https://doi.org/10.1155/2014/395803
14. Räisänen, S., Vehviläinen-Julkunen, K., Gissler, M., & Heinonen, S. (2010). Up to seven-fold inter-hospital differences in obstetric anal sphincter injury rates- A birth register-based study in Finland. *BMC Research Notes*, *3*(1). https://doi.org/10.1186/1756-0500-3-345
15. Smith, L. A., Price, N., Simonite, V., & Burns, E. E. (2013). Incidence of and risk factors for perineal trauma: A prospective observational study. *BMC Pregnancy and Childbirth*, *13*(1). https://doi.org/10.1186/1471-2393-13-59
16. Vaclavinkova V, Ryska P, Svabik K, et al. Gestational age and risk of severe perineal trauma: a population-based cohort study. *Acta Obstet Gynecol Scand.* 2015;94(5):571-578. https://pubmed.ncbi.nlm.nih.gov/25754164/