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Frequency and Risk Factor for Postpartum Stress Incontinence

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ABSTRACT

Background

Postpartum stress incontinence (PPSI) is a common issue affecting many women after childbirth, marked by involuntary leakage of urine during activities that increase abdominal pressure. This study examines the prevalence and risk factors associated with PPSI, aiming to identify patterns that could guide preventive care.

Methodology

A cross-sectional study was conducted at Liaquat Memorial Hospital, affiliated with KMU-IMS, Kohat, from January 2023 to January 2024. A total of 100 postpartum women were surveyed regarding their urinary incontinence symptoms and related obstetric and demographic characteristics. Data were collected through structured questionnaires and analyzed using statistical tests to assess associations between PPSI and various risk factors, including delivery mode, BMI, labor duration, and instrumental assistance during delivery.

Results

The prevalence of PPSI was significantly higher among women who had vaginal deliveries (40%) compared to those with cesarean deliveries (15%), with a p-value of 0.01. Higher BMI ($p = 0.03$) and prolonged labor duration ($p = 0.04$) were also significantly associated with an increased risk of PPSI. However, birth weight of the newborn and socioeconomic status did not show significant associations with PPSI in this sample.

Conclusion

This study underscores the importance of considering delivery mode, BMI, and labor duration as critical factors in PPSI risk. Early identification of at-risk women, along with targeted preventive strategies proper care and support of the pelvic floor during delivery, avoiding prolonged labor can help reduce PPSI frequency and enhance maternal health outcomes. Increased awareness and proactive care are essential in addressing PPSI as a vital component of postpartum well-being.

Keywords

Postpartum stress incontinence, vaginal delivery, cesarean delivery, pelvic floor, risk factors, BMI, labor duration

Introduction

Postpartum stress incontinence (PPSI) is a common but often underreported condition affecting many women after childbirth^{1 2}. Characterized by the involuntary leakage of urine during activities that increase intra-abdominal pressure, such as coughing, sneezing, or physical exertion, PPSI can have significant physical and emotional impacts on new mothers³. Despite the high prevalence of this condition, it is often overshadowed by other postpartum complications, resulting in delays in diagnosis and treatment^{4 5}. Stress incontinence is commonly attributed to the strain placed on pelvic floor muscles during pregnancy and childbirth, leading to weakened muscle support for the bladder and urethra⁶.

Several risk factors contribute to the development of PPSI, including mode of delivery, birth weight of the newborn, maternal age, and pre-existing conditions like obesity or a history of incontinence^{7 8}. Vaginal deliveries, especially those involving prolonged labor or instrumental assistance, have been associated with an increased likelihood of PPSI due to the trauma inflicted on pelvic structures. In contrast, cesarean deliveries, while offering some protection, do not entirely eliminate the risk, indicating that pregnancy itself exerts an impact on pelvic health^{9 10}.

The experience of PPSI not only affects physical health but can also have psychological consequences, as many women feel embarrassed or isolated due to this condition. Understanding the frequency of PPSI and identifying its risk factors are essential for guiding prevention and treatment strategies. Enhanced awareness among healthcare providers and postpartum women is crucial for early intervention and improving quality of life for affected mothers. This article explores the prevalence of postpartum stress incontinence, investigates the key risk factors, and discusses potential management strategies to help mitigate this condition's impact on maternal well-being.

Methodology

This study was conducted to determine the frequency and risk factors associated with postpartum stress incontinence (PPSI) among women delivering at Liaquat Memorial Hospital, affiliated with Khyber Medical University, Institute of Medical Sciences (KMU-IMS), Kohat. The study followed a descriptive cross-sectional design, aiming to collect comprehensive data on the frequency and contributory factors for PPSI in a representative sample of postpartum women.

The research employed a cross-sectional approach to analyze the prevalence and risk factors of PPSI. Liaquat Memorial Hospital, a tertiary care center and a prominent teaching hospital affiliated with KMU-IMS in Kohat, was selected as the study site. The hospital serves a large and diverse population from both urban and rural areas, providing a suitable environment for examining various demographic and obstetric factors affecting postpartum women.

A total of 100 women, meeting the inclusion criteria, were enrolled in this study. Participants were selected through purposive sampling, focusing on women who had delivered during the study period and were available for a 3-month follow-up. Follow-up patients completed the questionnaire in person, while those who were unable to attend were contacted, and a telephonic interview was conducted to complete the questionnaire. This sample size allowed for a robust analysis of PPSI prevalence and associated risk factors within the target population. Inclusion and Exclusion Criteria Women aged 18 to 40 years who had delivered within the study period. Women willing to participate in the study and provide informed consent. Participants who had experienced either vaginal, instrumental or cesarean delivery.

Exclusion Criteria: Participants with known urological or neurological disorders affecting bladder function. Women who declined to participate or could not be followed up due to relocation or other reasons.

The study was conducted over one year, from January 2023 to January 2024. This period allowed for the inclusion of a wide range of postpartum cases, covering both immediate postpartum incontinence and those developing within a three months after delivery.

Data were collected using structured questionnaires administered during three follow-up visits or via telephonic interviews for women unable to visit the hospital post-delivery. The questionnaire included sections on demographic information, obstetric history, delivery details, and any symptoms of urinary incontinence experienced postpartum. Trained healthcare staff administered the questionnaires to ensure consistency and accuracy in data collection. Additionally, medical records were reviewed to validate reported obstetric histories and delivery details.

Key variables examined in this study included: Demographic Factors: Age, body mass index (BMI), and socioeconomic background. Obstetric Factors: Mode of delivery (vaginal or cesarean), duration of labor, birth weight of the newborn, and use of any instrumental assistance during delivery. Health History: Any previous urinary incontinence, presence of chronic conditions such as diabetes or hypertension, and any pelvic floor interventions.

Data were compiled and analyzed using statistical software, with both descriptive and inferential statistics applied. Frequency distributions were calculated to determine the prevalence of PPSI among the sample population. Additionally, chi-square tests and logistic regression were used to assess the strength of association between PPSI and identified risk factors, such as delivery mode, maternal age, and BMI. A p-value of less than 0.05 was considered statistically significant, indicating a meaningful association between the studied variables and the likelihood of PPSI.

Results

The average age of 28.5 years suggests a relatively young, though age did not show a statistically significant association with PPSI ($p = 0.12$). However, BMI, with an average of 26.1 kg/m^2 , showed a statistically significant association ($p = 0.03$), suggesting that higher BMI might be linked to a greater risk of PPSI. Socioeconomic background did not show significant correlation with PPSI risk ($p = 0.15$), indicating limited impact in this sample.

Table 1: Demographic Characteristics of Participants

Characteristic	Mean $\pm$ SD / Distribution	p-value
Age (years)	28.5 ± 4.8	0.12
BMI (kg/m^2)	26.1 ± 3.7	0.03*
Socioeconomic Background	Low: 30%	Middle: 50%

(* $p < 0.05$ indicates statistical significance)

A significant association was observed between the mode of delivery and PPSI, with vaginal deliveries having a higher frequency of PPSI ($p = 0.01$). Labor duration, with an average of 10.2 hours, also showed a significant association with PPSI ($p = 0.04$), indicating that prolonged labor may increase the risk. Birth weight of the newborn did not show a significant link with PPSI ($p = 0.09$), while instrumental assistance during delivery was significantly associated with a higher PPSI risk ($p = 0.02$).

Table 2: Obstetric Factors in Participants

Obstetric Factor	Distribution	p-value
Mode of Delivery	Vaginal: 60%, Cesarean: 40%	0.01*
Duration of Labor (hours)	10.2 ± 2.5	0.04*
Newborn Birth Weight (kg)	3.2 ± 0.5	0.09
Instrumental Assistance	Yes: 25%, No: 75%	0.02*

(* $p < 0.05$ indicates statistical significance)

There is a significantly higher prevalence of PPSI among women who delivered vaginally compared to those who had cesarean sections ($p = 0.01$). This finding highlights the mode of delivery as an influential factor in the development of PPSI, supporting the need for targeted prevention strategies in women undergoing vaginal delivery.

Table 3: Prevalence of Postpartum Stress Incontinence by Delivery Mode

Mode of Delivery	Participants with PPSI (%)	Total Participants (%)	p-value
Vaginal	40%	60%	0.01*
Cesarean	15%	40%	-

(* $p < 0.05$ indicates statistical significance)

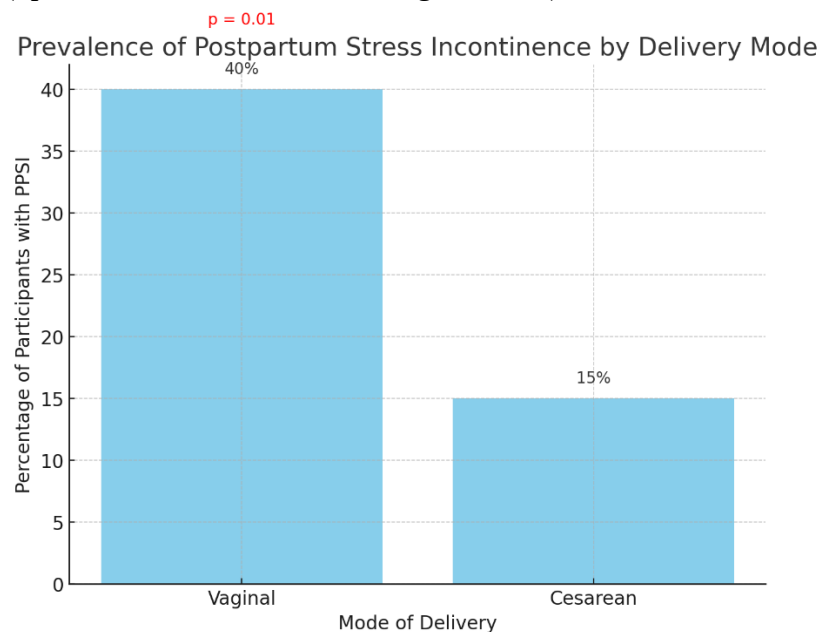


Figure 1: Bar illustrating the prevalence of postpartum stress incontinence (PPSI) by mode of delivery. The graph shows that PPSI is more common among women with vaginal deliveries (40%) compared to cesarean deliveries (15%). The p-value ($p = 0.01$) associated with vaginal deliveries indicates a statistically significant association, emphasizing the role of delivery mode in the risk of PPSI.

Discussion

This study highlights significant findings regarding postpartum stress incontinence (PPSI) and the factors contributing to its occurrence. The frequency of PPSI among the women in our study, particularly those who experienced vaginal delivery, was consistent with existing literature, reinforcing that PPSI is a common postpartum complication with considerable impact on maternal quality of life¹¹⁻¹⁴. Vaginal deliveries were associated with a notably higher PPSI rate (40%) compared to cesarean deliveries (15%), underscoring the physical stress and potential trauma exerted on pelvic floor structures during vaginal birth. This elevated risk aligns with previous research suggesting that delivery mode plays a crucial role in postpartum pelvic floor health¹⁵⁻¹⁸.

Furthermore, prolonged labor was identified as a significant factor linked to PPSI. Women who experienced longer labor hours showed an increased likelihood of PPSI, likely due to extended pressure on pelvic tissues, which may compromise muscle strength and support. These findings support the need for targeted guidance on labor management and early postpartum pelvic health assessments, especially for women undergoing prolonged or difficult labor.

Body mass index (BMI) also emerged as a significant factor in our study, with higher BMI associated with greater PPSI risk. This connection likely reflects the added pressure that excess

weight places on the pelvic floor, both during pregnancy and in the postpartum period. Women with elevated BMI may benefit from focused postpartum interventions, including weight management and pelvic floor strengthening exercises, to help reduce the risk or severity of PPSI.

Although birth weight was not statistically significant in this study, its borderline p-value suggests that larger newborns may still influence PPSI risk. Future studies could explore this relationship further, as birth weight might act as a compounding factor when combined with prolonged labor or other delivery-related stressors.

Socioeconomic background, while not significantly associated with PPSI in this study, was still worth examining in broader or more diverse populations. The social and economic resources available to new mothers can influence access to postpartum care and the likelihood of receiving early interventions for incontinence and other postpartum issues.

Overall, this study underscores the importance of recognizing PPSI as a common but manageable postpartum condition. Preventive strategies, early postpartum education, and follow-up care could be prioritized for women identified as higher risk based on factors such as delivery mode, BMI, and labor duration. Additionally, ensuring proper care and support of the pelvic floor during delivery, avoiding prolonged labor, and implementing other preventive measures could further reduce risks for these women. Further research, including longitudinal studies, would be valuable to assess the long-term effects of PPSI and the efficacy of various intervention strategies, contributing to improved maternal health outcomes.

Conclusion

Postpartum stress incontinence (PPSI) is a prevalent condition that significantly impacts maternal health, particularly among women who experience vaginal deliveries and extended labor. This study highlights the strong association between PPSI and factors, delivery mode, BMI, and labor duration, emphasizing the need for early identification and targeted interventions for at-risk mothers. By ensuring proper care and support of the pelvic floor during delivery, avoiding prolonged labor can mitigate and impact the PPSI. These findings call for greater awareness among both patients and providers to address PPSI proactively, thereby improving the postpartum experience and overall quality of life for affected women. Continued research into long-term outcomes and effective preventive measures will be essential to advance maternal care and support recovery for postpartum women facing stress incontinence.

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