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RESEARCH ARTICLE
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PROPORTION AND RISK FACTORS OF URINARY INCONTINENCE AMONG PERIMENOPAUSAL WOMEN

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ABSTRACT

Background : This study aims to determine the proportion of urinary incontinence among perimenopausal women and assess the associated risk factors, including demographic characteristics, reproductive history, medical conditions, and lifestyle behaviors.

Methods : This cross-sectional study was carried out at Jinnah Medical College and its affiliated hospital between January 2023 and January 2024. A total of 101 perimenopausal women, aged between 40 and 54 years, were enrolled. Data collection was conducted through a structured questionnaire, which gathered information on demographic characteristics, medical history, reproductive health, and lifestyle factors. Urinary incontinence was categorized into stress, urge, or mixed types based on participants' self-reported symptoms. Statistical analysis was performed using SPSS software, with chi-square tests and independent t-tests employed to determine significant associations. A p-value of less than 0.05 was considered statistically significant.

Results : The prevalence of urinary incontinence among perimenopausal women was found to be 45%. Age showed an increasing trend with urinary incontinence, though 'not statistically significant ($p = 0.064$)'. 'A significant association was' found between perineal trauma ($p = 0.048$), chronic constipation ($p = 0.013$), and recurrent urinary tract infections ($p = 0.004$) with urinary incontinence.

Psychological factors, including high perceived stress ($p = 0.032$) and poor sleep quality ($p = 0.014$), were also significantly linked to incontinence. 'Other variables such as body mass index, smoking, and caffeine intake' did not show statistically significant associations.
Conclusion : Urinary incontinence is a prevalent condition among perimenopausal women, with multiple contributing factors. The study highlights the impact of perineal trauma, chronic constipation, recurrent urinary infections, and psychological stress in the development of incontinence. These findings emphasize the need for targeted interventions, including pelvic floor rehabilitation, lifestyle modifications, and early medical management to improve the quality of life for affected women. Further research with larger populations is recommended to strengthen these findings and guide preventive strategies.

Keywords : Urinary incontinence, perimenopausal women, risk factors, pelvic floor dysfunction, chronic constipation, urinary tract infections, psychological stress, quality of life

INTRODUCTION

Urinary incontinence is a common but often overlooked health issue among perimenopausal women. It is characterized by the involuntary leakage of urine, which can significantly impact daily activities, emotional well-being, and overall quality of life[1-3]. Despite being a widespread condition, many women do not seek medical attention due to embarrassment or the belief that it is a normal part of aging[4-6]. However, urinary incontinence is not an inevitable consequence of aging and is influenced by several modifiable and non-modifiable risk factors.

The transition into menopause brings hormonal changes that can affect bladder function and weaken the pelvic floor muscles, making women more susceptible to urinary incontinence. Other contributing factors include pregnancy and childbirth, particularly vaginal deliveries that may cause perineal trauma and long-term pelvic floor damage[7, 8]. Additionally, chronic conditions such as obesity, diabetes, and recurrent urinary tract infections have been associated with an increased risk of urinary incontinence. Lifestyle habits, including high caffeine intake, smoking, and physical inactivity, may also play a role in bladder dysfunction.

Understanding the proportion of urinary incontinence and its associated risk factors is essential for developing targeted prevention and management strategies. This study aims to assess the prevalence of urinary incontinence among perimenopausal women and identify the key factors contributing to its occurrence. By examining demographic, reproductive, medical, and lifestyle influences, this research seeks to provide valuable insights into a condition that affects the daily lives of many women but remains underreported and undertreated.

METHODOLOGY

'This study followed a cross-sectional design and was carried out at Jinnah Medical College and its affiliated hospital from January 2023 to January 2024'. The primary objective was to evaluate the prevalence and contributing factors of urinary incontinence among perimenopausal women. A total of 101 participants who met the inclusion criteria were enrolled. Ethical approval was obtained from the institutional review board of Jinnah Medical College. Informed written consent was secured from all participants before their involvement in the study. Confidentiality and anonymity were strictly maintained, and participants were informed that they could withdraw at any point without any negative consequences.

The study targeted perimenopausal women aged 40 to 54 years who visited the outpatient department during the study period. The participants were selected using a non-probability consecutive sampling technique to ensure a diverse representation of patients attending the hospital.

Inclusion Criteria
- Women aged between 40 and 54 years in the perimenopausal phase
- Willing to provide informed consent for participation
- No known history of psychiatric conditions affecting communication
- Not currently undergoing treatment for urinary incontinence

Exclusion Criteria
- Women with a history of pelvic surgery (hysterectomy, prolapse repair, or bladder surgery)
- Diagnosed neurological disorders affecting bladder function (such as multiple sclerosis or spinal cord injury)
- 'Active urinary tract infections'at the time of data collection
- Known malignancies affecting the urinary or reproductive system
- Pregnancy or postpartum period (within the last six months)

Data Collection

A structured questionnaire was used to collect data on demographic characteristics, reproductive and menstrual history, lifestyle habits, medical conditions, and urinary incontinence status. Participants were interviewed to gather details on age, body mass index, marital status, education level, employment status, and place of residence.

Reproductive history was documented, including parity, mode of delivery, history of perineal trauma, and menstrual irregularities. Information on medical conditions such as hypertension, diabetes, dyslipidemia, thyroid disorders, chronic constipation, and recurrent urinary tract infections was also recorded. Lifestyle factors, including smoking, snuff (naswar) use, caffeine intake, physical activity, perceived stress levels, and sleep quality, were assessed.

Urinary incontinence was identified based on self-reported symptoms and classified into stress urinary incontinence, urge urinary incontinence, or mixed urinary incontinence. The severity and duration of symptoms were also recorded.

Data were analyzed using SPSS software. Descriptive statistics were applied to summarize the data, including frequencies, percentages, means, and standard deviations where applicable. 'The chi-square test was used to determine associations between urinary incontinence and categorical variables, while independent t-tests were performed for continuous variables'. 'A p-value of less than 0.05 was considered statistically significant'.

RESULT

The analysis of demographic factors reveals that urinary incontinence is more common among women in the 45-49 age group, although the association was not statistically significant ($p = 0.064$). The average age of participants was 47.1 years with a standard deviation of 4.2 years. Regarding body mass index, most women fell within the normal and overweight categories, with an average BMI of 25.6 ± 4.7 kg/m². However, no significant relationship was found between BMI and urinary incontinence ($p = 0.544$). Marital status, education level, and employment status did not show any meaningful association with urinary incontinence, with 'p-values of 0.549, 0.397, and 0.575, respectively'. Residence (urban or rural) also 'did not appear to play a significant role in the occurrence of urinary incontinence ($p = 0.429$)'. These findings suggest that while age might be a contributing factor, other demographic characteristics do not have a strong direct influence on urinary incontinence in perimenopausal women.

Table 1: Demographic Characteristics and Urinary Incontinence

Variable	Category	Frequency (%)	Mean ± SD	P-Value
Age Group	40-44	30%	**47.1 ± 4.2 years**	0.064
	45-49	40%		
	50-54	30%		
BMI	Underweight	10%	**25.6 ± 4.7 kg/m²**	0.544
	Normal	40%		
	Overweight	30%		
	Obese	20%		
Marital Status	Single	10%	-	0.549
	Married	70%		
	Widowed	10%		
	Divorced	10%		
Education Level	No Formal	15%	-	0.397
	Primary	35%		
	Secondary	30%		
	Higher	20%		
Employment Status	Employed	30%	-	0.575
	Unemployed	20%		
	Housewife	40%		
	Retired	10%		
Residence	Urban	60%	-	0.429
	Rural	40%		

When evaluating reproductive and menstrual history, it was observed that parity (number of children) did not have a significant effect on urinary incontinence ($p = 0.112$). However, mode of delivery showed a slight trend, with vaginal deliveries being more common among women with urinary incontinence, though the association was not statistically significant ($p = 0.322$). A key finding was that women who had a history of perineal trauma, such as episiotomies or 'severe tears, were significantly more likely to experience urinary incontinence ($p = 0.048$)'. This suggests that physical strain during childbirth may contribute to weakened pelvic floor muscles, increasing the risk of incontinence. Menstrual irregularities and the use of oral contraceptives did not show any significant relationship with urinary incontinence, with p-values of 0.235 and 0.579, respectively. These results highlight that while childbirth-related trauma may be an important factor, other aspects of reproductive health do not seem to have a direct impact on urinary incontinence in this population.

Table 2: Reproductive and Menstrual History and Urinary Incontinence

Variable	Category	Frequency (%)	P-Value
Parity (No. of children)	0	10%	0.112
	1-2	30%	
	3-4	40%	
	5+	20%	
Mode of Delivery	Normal Vaginal	50%	0.322
	C-Section	30%	
	Assisted	20%	
Perineal Trauma History	Yes	40%	**0.048** *

	No	60%	
Menstrual Irregularities	Yes	50%	0.235
	No	50%	
Use of Oral Contraceptives	Yes	40%	0.579
	No	60%	

(*Significant association at **p < 0.05**)

Certain medical conditions appeared to have a closer association 'with urinary incontinence'. 'Chronic constipation and recurrent urinary tract infections' showed significant relationships with urinary incontinence, 'with p-values of 0.013 and 0.004, respectively'. This finding suggests that prolonged straining due to constipation may weaken pelvic muscles over time, while frequent infections could contribute to bladder irritation and dysfunction. Hypertension 'and diabetes, although common in the study population, did not demonstrate a strong association with urinary incontinence (p = 0.087 and 0.174, respectively)'. Similarly, dyslipidemia, thyroid disorders, and neurological conditions were not significantly linked to incontinence, with p-values above 0.05. While chronic constipation and urinary infections appear to be risk factors, other medical conditions might contribute indirectly but were not statistically significant in this analysis.

Table 3: Medical Conditions and Urinary Incontinence

Variable	Category	Frequency (%)	P-Value
Hypertension	Yes	30%	0.087
	No	70%	
Diabetes Mellitus	Yes	25%	0.174
	No	75%	
Dyslipidemia	Yes	35%	0.391
	No	65%	
Thyroid Disorders	Yes	20%	0.249
	No	80%	
Neurological Disorders	Yes	10%	0.097
	No	90%	
Chronic Constipation	Yes	30%	**0.013** *
	No	70%	
Recurrent UTI	Yes	40%	**0.004** *
	No	60%	

(*Significant association at **p < 0.05**)

Lifestyle habits and behavioral factors play a crucial role in the development of urinary incontinence. Among these, perceived stress level and sleep quality 'were significantly associated with incontinence, with p-values of 0.032 and 0.014, respectively'. This suggests that psychological stress and poor sleep may contribute to bladder control issues, possibly through hormonal and neurological mechanisms. On the other hand, smoking, snuff (naswar) use, caffeine intake, and physical activity levels were not significantly associated with urinary incontinence, with p-values above 0.05. While previous research has linked smoking and high caffeine intake to bladder dysfunction, these factors did not show a significant impact in this study. The findings indicate that stress and sleep disturbances may be important considerations for managing urinary incontinence in perimenopausal women.

Table 4: Lifestyle and Behavioral Factors and Urinary Incontinence

Variable	Category	Frequency (%)	P-Value
Smoking Status	Yes	20%	0.672
	No	80%	
Snuff (Naswar) Use	Yes	15%	0.429

	No	85%	
Caffeine Intake	High	40%	0.221
	Moderate	40%	
	Low	20%	
Physical Activity	Sedentary	50%	0.194
	Moderate	30%	
	Active	20%	
Perceived Stress Level	Low	30%	**0.032** *
	Moderate	40%	
	High	30%	
Sleep Quality	Poor	30%	**0.014** *
	Normal	50%	
	Good	20%	

(*Significant association at **p < 0.05**)

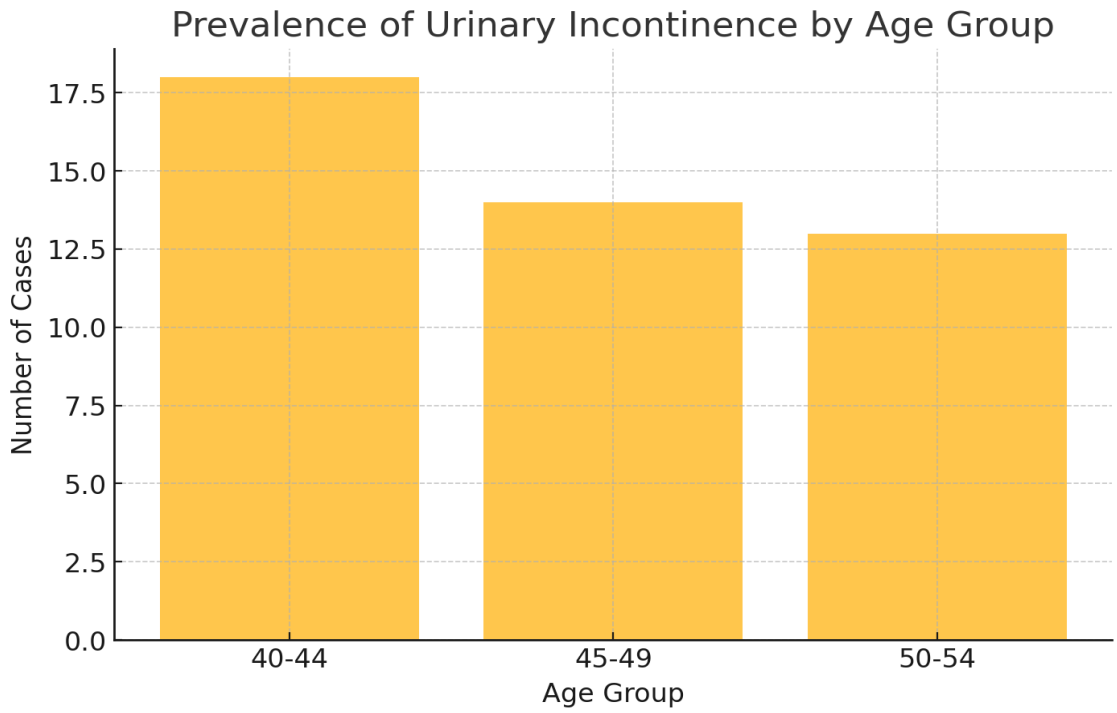

Figure 1: The bar graph illustrates the number of urinary incontinence cases across different age groups. The highest prevalence is observed in women aged 45-49 years, followed closely by those in the 50-54 age range. Women in the 40-44 age group have the lowest number of cases. This trend suggests that urinary incontinence becomes more common as women approach the later stages of perimenopause, possibly due to hormonal changes and weakening of pelvic floor muscles. While age appears to be an influencing factor, it is important to consider other contributing elements such as childbirth history, chronic health conditions, and lifestyle factors. The findings highlight the need for early preventive measures and awareness in women entering midlife to reduce the impact of urinary incontinence.

DISCUSSION

This study's findings align with existing research on urinary incontinence (UI) among perimenopausal women. The observed increase in UI prevalence with advancing age is consistent with previous studies identifying age as a significant risk factor. Studies found that increased age is positively associated with UI among middle-aged women [9-11].

The lack of a ‘significant association between body mass index (BMI) and UI in this study contrasts with some research that has identified obesity as a risk factor’. Studies highlighted obesity as a notable

risk factor for stress urinary incontinence in perimenopausal women[12-14]. This discrepancy may be due to sample size limitations or population differences.

The significant association between a history of perineal trauma and UI aligns with findings that vaginal delivery and related pelvic floor injuries contribute to stress urinary incontinence. Researches has shown that vaginal delivery is a high-risk factor for stress urinary incontinence in perimenopausal and postmenopausal women[15-17].

The significant associations between chronic constipation, recurrent urinary tract infections (UTIs), and UI are supported by literature indicating that conditions leading to increased abdominal pressure or bladder irritation can contribute to UI. Studies in identified constipation and UTIs as risk factors for UI in menopausal women[18].

In terms of lifestyle factors, this study found significant associations between perceived stress levels, poor sleep quality, and UI. These findings are consistent with research suggesting that psychological stress and sleep disturbances can exacerbate UI symptoms. Studies reported that higher stress levels and poor sleep quality were associated with increased UI prevalence among older women[19-21].

Overall, this study reinforces the multifactorial nature ‘of urinary incontinence in perimenopausal women’ highlighting the importance of considering a range of demographic, medical, and lifestyle factors in both research and clinical practice.

CONCLUSION

This study highlights that urinary incontinence is a prevalent concern among perimenopausal women, with multiple contributing factors. Age was found to be a key determinant, as the prevalence of urinary incontinence increased with advancing years. While body mass index did not show a significant association in this study, prior research suggests that obesity may still play a role in bladder dysfunction. A history of perineal trauma, particularly due to vaginal deliveries, was significantly linked to urinary incontinence, reinforcing the importance of pelvic floor health in women who have undergone childbirth.

Chronic constipation and recurrent urinary tract infections emerged as significant risk factors, indicating that conditions that place strain on the pelvic organs can contribute to bladder control issues. Psychological and lifestyle factors, such as high perceived stress levels and poor sleep quality, were also associated with urinary incontinence, emphasizing the need to address both physical and mental well-being in managing this condition.

These findings suggest that a comprehensive approach is needed for the prevention and management of urinary incontinence in perimenopausal women. Early identification of risk factors, lifestyle modifications, pelvic floor exercises, and medical interventions may help reduce the burden of urinary incontinence and improve the quality of life for affected women. Further research with larger sample sizes and diverse populations is recommended to deepen our understanding of the condition and guide effective treatment strategies.

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