



Original Article

## Pattern of Menstrual Disorders and Associated Risk Factors among Reproductive-Age Women Attending a Tertiary Care Hospital: An Observational Study

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### ABSTRACT

**Background:** Menstrual disorders are common among reproductive-age women and adversely affect physical comfort, daily functioning, and reproductive health. Hospital-based data are useful for identifying the predominant clinical patterns and associated risk factors in treatment-seeking women. Objectives: This study assessed the pattern of menstrual disorders and their associated risk factors among reproductive-age women attending a tertiary care hospital.

**Methods:** A hospital-based observational cross-sectional study was conducted among 100 women aged 18-45 years at Maharajahs Institute of Medical Sciences, Nellimarla, Vizianagaram, Andhra Pradesh, India, from February 2025 to January 2026. Data on sociodemographic profile, body mass index, physical activity, hemoglobin status, menstrual characteristics, associated symptoms, and selected risk factors were collected and analyzed using descriptive statistics and chi-square test.

**Results:** Of the 100 women studied, 76.0% had at least one menstrual disorder. Dysmenorrhea was the most common disorder [24.0%], followed by heavy menstrual bleeding [18.0%] and oligomenorrhea [13.0%]. Among women with menstrual disorders, severe lower abdominal pain [40.8%], fatigue [38.2%], and premenstrual symptoms [35.5%] were frequent associated features. Menstrual disorders showed significant associations with overweight or obesity, sedentary lifestyle, moderate-to-high perceived stress, anemia, and polycystic ovary syndrome.

**Conclusion:** Menstrual disorders were highly prevalent in this tertiary care cohort. Dysmenorrhea and heavy menstrual bleeding predominated, while excess body weight, physical inactivity, stress, anemia, and polycystic ovary syndrome emerged as key associated factors. Early clinical screening and integrated management are important for improving reproductive health outcomes.

**Keywords:** Menstrual disorders; dysmenorrhea; heavy menstrual bleeding; reproductive-age women; risk factors; tertiary care hospital.

### INTRODUCTION

Menstrual disorders constitute one of the most frequent gynecological concerns among women in the reproductive age group and remain an important yet underrecognized component of women's health. Disturbances in cycle frequency, duration, regularity, flow volume, and associated pain can impair physical comfort, emotional well-being, daily

functioning, work productivity, and social participation [3-6]. Standardized terminology proposed by the International Federation of Gynecology and Obstetrics has improved consistency in describing normal and abnormal uterine bleeding patterns and in classifying underlying causes, thereby strengthening both clinical care and research comparability [1,2].

The spectrum of menstrual disorders is broad and includes dysmenorrhea, heavy menstrual bleeding, oligomenorrhea, polymenorrhea, amenorrhea, hypomenorrhea, and intermenstrual bleeding. Their occurrence is influenced by a complex interplay of biological, endocrine, nutritional, metabolic, psychosocial, and lifestyle factors [3,4]. Dysmenorrhea is frequently reported as the dominant complaint in community and institutional studies, whereas heavy menstrual bleeding contributes substantially to fatigue, diminished quality of life, iron deficiency, and iron deficiency anemia [3,5,7,8]. In Indian settings, available evidence shows considerable heterogeneity in prevalence estimates, reflecting differences in age composition, sociocultural context, care-seeking behavior, and methodological definitions [5,6].

Menstrual health is increasingly viewed as a clinical marker of overall reproductive and metabolic status. Obesity and excess adiposity are associated with irregular cycles, oligomenorrhea, and hormonal imbalance, while sedentary lifestyle and psychosocial stress further contribute to cycle disturbances and symptom severity [3,11-14]. Polycystic ovary syndrome is a common endocrine disorder characterized by menstrual irregularity and hyperandrogenic manifestations, and thyroid dysfunction also alters menstrual cyclicity through its effects on ovulation and reproductive hormonal regulation [9,10]. These associated conditions are clinically relevant because early recognition of menstrual symptoms can prompt timely evaluation of broader underlying disorders.

Despite their frequency, menstrual disorders are often normalized, underreported, or tolerated until symptoms interfere significantly with daily life. Evidence from Indian studies suggests that women frequently seek care late, and hospital-based data remain useful for identifying prevalent patterns and associated risk factors in treatment-seeking populations [5,6]. Tertiary care hospitals, in particular, receive women with a wide range of menstrual complaints and therefore provide an appropriate setting to examine both symptom profiles and correlates.

Against this background, the present study was undertaken to assess the pattern of menstrual disorders among reproductive-age women attending a tertiary care hospital and to identify associated risk factors, with special emphasis on nutritional status, physical activity, stress, anemia, polycystic ovary syndrome, thyroid dysfunction, and family history. The findings were intended to generate locally relevant evidence that could support earlier screening, targeted counseling, and appropriate gynecological referral in women presenting with menstrual complaints.

## **METHODOLOGY**

### **Study design and setting**

This hospital-based observational study with a cross-sectional design was conducted in the Department of Obstetrics and Gynecology at Maharajahs Institute of Medical Sciences, Nellimarla, Vizianagaram, Andhra Pradesh, India, over a one-year period from February 2025 to January 2026.

### **Study population and eligibility criteria**

The study included women of reproductive age, 18-45 years, attending the tertiary care hospital with menstrual complaints or for gynecological consultation during the study period. Women who provided informed consent were enrolled. Women who were pregnant, had attained menopause, or had incomplete clinical information were excluded from analysis. Only eligible women with complete interview and clinical assessment records were included.

### **Sample size and sampling**

A total sample size of 100 women was considered for the present study. Consecutive eligible participants attending the hospital during the study period were recruited until the desired sample size was achieved. This approach was adopted to reflect the real-world profile of women seeking tertiary care for menstrual problems and related concerns.

### **Data collection**

Data were collected using a structured case record form after detailed history taking and clinical assessment. Information was obtained regarding age, marital status, residence, socioeconomic status, body mass index, physical activity, menstrual history, associated symptoms, and relevant medical and gynecological risk factors. Menstrual variables recorded included cycle frequency, duration, regularity, amount of bleeding, and presence of pain. For women reporting more than one complaint, the predominant symptom at presentation was considered the principal menstrual disorder for uniform tabulation. Associated features such as lower abdominal pain, fatigue, premenstrual symptoms, passage of clots, acne or hirsutism, and infertility or subfertility were also documented.

### **Operational definitions**

Menstrual disorders were categorized using standard clinical descriptions consistent with accepted FIGO terminology for abnormal menstrual symptoms in the reproductive years [1,2]. Dysmenorrhea referred to painful menstruation, heavy

menstrual bleeding to excessive perceived menstrual blood loss interfering with quality of life, oligomenorrhea to infrequent cycles, polymenorrhea to frequent cycles, amenorrhea to absence of menstruation, hypomenorrhea to scanty flow, and intermenstrual bleeding to bleeding occurring between expected menstrual periods. Body mass index was classified as underweight, normal, overweight, and obese. Hemoglobin value below 12 g/dL was considered anemia for analysis. Risk factors including stress, sedentary behavior, polycystic ovary syndrome, thyroid dysfunction, and family history of menstrual disorder were recorded from history and available clinical records.

### Statistical analysis

Data were entered in Microsoft Excel and analyzed using appropriate statistical methods. Categorical variables were summarized as frequency and percentage, while continuous variables were expressed as mean and standard deviation. Associations between selected risk factors and the presence of menstrual disorders were assessed using chi-square test, and a p-value of less than 0.05 was considered statistically significant.

### Ethical considerations

The study was conducted in accordance with institutional ethical standards and responsible clinical research principles. Written informed consent was obtained from all participants before enrolment, and confidentiality of patient information was maintained throughout data collection, analysis, and reporting.

### RESULTS

A total of 100 reproductive-age women attending the tertiary care hospital were included in this observational study. The mean age of the participants was  $29.6 \pm 6.8$  years, with the largest proportion belonging to the 25-31 years age group [34.0%]. Most women were married [72.0%], resided in urban areas [58.0%], and belonged to the middle socioeconomic class [48.0%]. With respect to nutritional status, 34.0% were overweight and 18.0% were obese. A sedentary lifestyle was noted in 57.0% of women, while anemia [hemoglobin  $<12$  g/dL] was present in 33.0% [Table 1].

**Table 1. Baseline sociodemographic and clinical characteristics of study participants [n = 100]**

Variable	n	%
<b>Age group [years]</b>		
18-24	28	28.0
25-31	34	34.0
32-38	24	24.0
39-45	14	14.0
<b>Marital status</b>		
Married	72	72.0
Unmarried	28	28.0
<b>Residence</b>		
Urban	58	58.0
Rural	42	42.0
<b>Socioeconomic status</b>		
Lower	36	36.0
Middle	48	48.0
Upper	16	16.0
<b>BMI category</b>		
Underweight	10	10.0
Normal	38	38.0

Overweight	34	34.0
Obese	18	18.0
<b>Physical activity</b>		
Physically active	43	43.0
Sedentary	57	57.0
<b>Hemoglobin status</b>		
<12 g/dL	33	33.0
≥12 g/dL	67	67.0

Overall, 76 women [76.0%] had at least one menstrual disorder, whereas 24 women [24.0%] reported a normal menstrual pattern. For uniform analysis, the predominant presenting complaint was taken as the principal menstrual disorder in women with multiple symptoms. Dysmenorrhea was the most frequent disorder [24.0%], followed by heavy menstrual bleeding [18.0%] and oligomenorrhea [13.0%]. Amenorrhea, intermenstrual bleeding, polymenorrhea, and hypomenorrhea were observed less frequently [Table 2].

**Table 2. Pattern of menstrual disorders among study participants [n = 100]**

Menstrual pattern/disorder	n	%
No menstrual disorder	24	24.0
Dysmenorrhea	24	24.0
Heavy menstrual bleeding	18	18.0
Oligomenorrhea	13	13.0
Polymenorrhea	7	7.0
Amenorrhea	5	5.0
Intermenstrual bleeding	6	6.0
Hypomenorrhea	3	3.0
Total	100	100.0

Among the 76 women with menstrual disorders, severe lower abdominal pain was the leading associated symptom, reported by 31 women [40.8%]. Premenstrual symptoms were present in 27 [35.5%], fatigue or generalized weakness in 29 [38.2%], and passage of clots in 19 [25.0%]. Features suggestive of hyperandrogenism such as acne or hirsutism were observed in 17 women [22.4%], while infertility or subfertility was reported by 9 [11.8%] [Table 3].

**Table 3. Associated clinical features among women with menstrual disorders [n = 76]**

Clinical feature*	n	%
Severe lower abdominal pain	31	40.8
Fatigue/generalized weakness	29	38.2
Premenstrual symptoms	27	35.5
Passage of clots	19	25.0
Acne/hirsutism	17	22.4

Infertility/subfertility	9	11.8
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\*Multiple responses were possible.

Analysis of associated risk factors showed that menstrual disorders were significantly more common among women who were overweight or obese, sedentary, stressed, anemic, or had polycystic ovary syndrome. Overweight or obesity was present in 44 of 76 women with menstrual disorders [57.9%] compared with 8 of 24 women without disorders [33.3%] [ $p = 0.036$ ]. Similarly, moderate-to-high perceived stress [53.9% vs 25.0%,  $p = 0.015$ ], anemia [39.5% vs 12.5%,  $p = 0.014$ ], sedentary lifestyle [61.8% vs 41.7%,  $p = 0.048$ ], and PCOS [23.7% vs 4.2%,  $p = 0.032$ ] showed significant associations. Thyroid dysfunction and family history were more frequent among women with menstrual disorders, but these associations did not reach statistical significance [Table 4].

**Table 4. Association of selected risk factors with menstrual disorders**

Risk factor	Menstrual disorder present [n = 76]	Menstrual disorder absent [n = 24]	p-value
Overweight/obesity	44 [57.9%]	8 [33.3%]	0.036
Sedentary lifestyle	47 [61.8%]	10 [41.7%]	0.048
Moderate/high perceived stress	41 [53.9%]	6 [25.0%]	0.015
Anemia	30 [39.5%]	3 [12.5%]	0.014
PCOS	18 [23.7%]	1 [4.2%]	0.032
Thyroid dysfunction	10 [13.2%]	1 [4.2%]	0.284
Family history of menstrual disorder	22 [28.9%]	3 [12.5%]	0.108

In summary, menstrual disorders were highly prevalent in this cohort, affecting more than three-fourths of reproductive-age women attending the tertiary care hospital. Dysmenorrhea and heavy menstrual bleeding were the dominant patterns, while excess body weight, sedentary behavior, stress, anemia, and polycystic ovary syndrome emerged as the major associated risk factors.

## DISCUSSION

The present hospital-based observational study demonstrated that menstrual disorders were highly prevalent among reproductive-age women attending a tertiary care hospital, with 76.0% of participants reporting at least one disorder. This burden is substantial, yet it is broadly in line with published literature showing wide variation in prevalence according to definitions, age profile, setting, and healthcare-seeking behavior [3-6]. A recent review of Indian evidence reported marked heterogeneity in prevalence estimates across studies, underscoring the influence of sociocultural and methodological differences [6]. Our estimate likely reflects a treatment-seeking population enriched for symptomatic women, which explains the relatively high overall frequency.

Dysmenorrhea emerged as the most common menstrual disorder in the present study, followed by heavy menstrual bleeding and oligomenorrhea. This pattern is consistent with prior studies in which painful menstruation was the dominant complaint among women in the reproductive age group [3-6]. Laksham et al. from Puducherry also reported a high prevalence of dysmenorrhea and poorer quality of life among affected women [5]. The prominence of severe lower abdominal pain, fatigue, premenstrual symptoms, and passage of clots among symptomatic women in our series supports the clinically disruptive nature of these disorders. The presence of acne or hirsutism in a subset of participants further suggests underlying endocrine dysfunction in some women.

A notable finding of this study was the significant association of menstrual disorders with overweight or obesity. This agrees with earlier evidence showing that increased adiposity is linked to menstrual irregularity, oligomenorrhea, and hormonal alterations involving insulin resistance and androgen excess [9,11,12]. Wei et al. demonstrated that obese women had greater odds of irregular cycles, while Zhou and colleagues reported an association between obesity and oligomenorrhea or irregular menstruation in women of childbearing age [11,12]. Our findings also parallel recent Indian data showing a significant relationship between menstrual disorders, body mass index, and physical activity [14]. The association observed with sedentary lifestyle further supports the importance of modifiable behavioral factors.

Moderate-to-high perceived stress was another significant correlate in the present cohort. Stress has been recognized as an amplifier of menstrual pain and irregularity through neuroendocrine pathways [3,13]. The significant link between anemia and menstrual disorders is also clinically plausible. Heavy menstrual bleeding is a major contributor to iron deficiency and iron deficiency anemia, and this relationship has been emphasized in recent literature [7,8]. Women with menstrual disturbances in our study frequently reported fatigue and weakness, reinforcing this association. Polycystic ovary syndrome also showed a significant association, which is expected because menstrual irregularity is one of its cardinal features [9]. Thyroid dysfunction was more frequent in women with menstrual complaints, although the association was not statistically significant, a direction still consistent with prior literature on thyroid-related menstrual disturbance [10]. Overall, the findings suggest that menstrual disorders are practical clinical markers of nutritional, metabolic, endocrine, and psychosocial vulnerability in reproductive-age women.

### Limitations

This study was conducted in a single tertiary care hospital with a relatively small sample of 100 women, which limits wider population inference. The cross-sectional design identifies associations but does not establish temporal relationships. Risk factors such as stress and physical activity were based partly on participant reporting, introducing possible reporting bias. Detailed hormonal and imaging correlations were not available for all participants.

### CONCLUSION

Menstrual disorders were highly prevalent among reproductive-age women attending this tertiary care hospital, affecting more than three-fourths of the study population. Dysmenorrhea was the leading disorder, followed by heavy menstrual bleeding and oligomenorrhea. Significant associations were observed with overweight or obesity, sedentary lifestyle, perceived stress, anemia, and polycystic ovary syndrome, indicating that menstrual complaints frequently coexist with modifiable lifestyle factors and broader endocrine or metabolic disturbances. These findings emphasize the need for systematic evaluation of menstrual symptoms in outpatient settings, not only for symptomatic relief but also for early detection of anemia, obesity-related dysfunction, and hormonal disorders. Integrated counseling, screening, and timely referral can improve reproductive health outcomes in practice.

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