

Assessment of Dysmenorrhea and its Associated Factors among Females of District Ghaziabad

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ABSTRACT

Background: Dysmenorrhea is a very common problem and a large number of females in our society are suffering from it. This study aims to determine the prevalence of dysmenorrhea and its associated lifestyle and other factors.

Methodology: This was a cross-sectional study which was conducted among females aged between 15 to 45 years in urban population of district Ghaziabad through a house-to-house survey, using a pre-designed, semi-structured questionnaire.

Results: The prevalence of dysmenorrhea was 67.8%. Out of the participants having dysmenorrhea, 36.5% females were experiencing mild pain, 44.3% were experiencing moderate pain and 19.1% were experiencing severe pain. The chances of dysmenorrhea were significantly more in participants of 15 to 25 years of age, participants who had attained early menarche, those having pre-menstrual symptoms and those who had passage of clots during menstruation, participants consuming refined flour, fried food, preservatives, soda and those who were skipping meals. Participants doing physical exercises showed less chance of menstrual pain.

Conclusions: The prevalence of dysmenorrhea is quite high in our society. It may be related to factors which are modifiable, such as diet and exercise. An improvement of lifestyle is recommended.

Key-words: Menarche, Dysmenorrhea, Physical activity, Pre-menstrual symptoms, Diet, Lifestyle

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INTRODUCTION

Menstruation is characterised by periodic shedding of uterine endothelium that is accompanied by periodic blood flow.¹ Every woman experience menstruation which constitutes an important part of their lives. However, it may be associated with various problems and complications, such as irregular menses, pre-menstrual syndrome, dysmenorrhea.² Dysmenorrhea or painful menstrual cycles one of the common menstrual problems faced by women.³ Dysmenorrhea is characterised by painful cramps during the menstrual cycle.⁴ These may cause morbidity and mortality if ignored for a long time. The most accepted aetiology of primary dysmenorrhea is that it is caused by increased release of uterine prostaglandins which are produced during sloughing of the endometrium.⁵ Pre-menstrual symptoms are physical, emotional and behavioural problems that occur before menstruation. Physical symptoms include nausea, headache, pain in abdomen, abdominal cramps, generalised pain, skin problems and tenderness of breasts. Emotional and behavioural symptoms include anger, irritability, loss of appetite, malaise and lethargy.⁶

Menstrual pain affects performance in academics and sports,⁶ it is an important cause of sickness absenteeism and restriction of activities⁷ and many women take self-medication for its relief.⁸

Menstrual pain affects a large number of women in our society and if ignored it may become a public health issue. This is considered a stigma in our society and not enough research has been carried out in India regarding this problem. In this research article, prevalence of dysmenorrhea among women in urban areas of district Ghaziabad has been discussed, along with the factors associated, which included the participants' chronological age, participants' age at attainment of menarche, presence of pre-menstrual symptoms, presence of clots, dietary habits since one-month, physical activities since 7 days and problems related to sleep, using the Insomnia Severity Index.⁹

The study was conducted to estimate the prevalence of dysmenorrhea among women in urban areas of district Ghaziabad and also to find association of dysmenorrhea with the participants' age, participants' age at attainment of menarche, presence of pre-menstrual symptoms, presence of clots, dietary habits since one-month, physical activities since 7 days and problems related to sleep since last 2 weeks.

METHODOLOGY

The present cross-sectional study was conducted from February 2023 to June 2023 among women of reproductive age group (15-45 years) by the department of community medicine of our tertiary care level institute situated in Ghaziabad city. The study

was conducted in the 5 urban administrative zones of district Ghaziabad. With 95% confidence interval and taking the prevalence as 48% from previous studies, the sample size was calculated as 416.

The females of age group 15-45 years who are permanent residents were included in the study. Pregnant and lactating females, those who were using hormonal contraceptives, those who had undergone any type of hysterectomy and those who refused to give consent for the study were excluded. Two stage sampling technique was used in the study. First, one locality from each zone was selected randomly. Then 83 houses in 4 localities and 84 from one locality were selected randomly to cover a total of 416 households. One female per house was interviewed.

The data was collected and entered in MS Excel 2021. Analysis was done with appropriate statistical method (Frequency distribution, Chi square test, binary and multinomial logistic regression) using STATA MP-17. The p value < 0.05 was considered statistically significant.

An approval was taken from the medical ethics committee of the institute before the start of the study. Informed written consent was taken from all the participants and their confidentiality was maintained. The participants were made comfortable and were explained that the interviews were only for the research purpose.

The Socio-economic status was calculated using Modified Kupuswamy scale.¹⁰ The severity of menstrual pain was assessed by using Multidimensional Scoring System of Andersch and Milsom. In this system, mild pain is defined as "pain when there is no limitation of normal activity, with infrequent requirements of analgesics and no systemic complaints", moderate pain is defined as "pain which affects daily activities, there is requirement of analgesics and few systemic complaints" and severe pain is defined as "pain when there is severe limitation of daily activities, poor response to analgesics and systemic complaints like vomiting, fainting etc".¹¹

For the ease of data analysis, consuming the food item more than 3 times a week was taken as "yes" and less than 3 times a week was taken as "no". "Habit of food restriction" referred to skipping meals more than 3 times a week.² The vigorous physical activities included heavy weight lifting, running, dancing, swimming or climbing upstairs during the last 7 days. Moderate physical activities included carrying light loads, bicycling, washing, cleaning etc during the last 7 days. Light physical activities included walking for at least 1 min. during the last 7 days.¹² The problems related to sleep were assessed using the Insomnia Severity Index (ISI).⁹ The variables included difficulty falling asleep, difficulty staying asleep, waking up too early, level of satisfaction with the current sleeping pattern, extent of the sleep problem in the interference with the daily activities, noticeability of the problem to others and the level of distress of the participant towards the problem;

since the last 2 weeks. The sleep pattern of the participants was scored as “no clinically significant insomnia” (0-7), “subthreshold insomnia” (8-14), “clinical insomnia of moderate severity” (15-21) and “severe clinical insomnia” (22-28). Participants having score of 0 to 7 were classified as not “having problems related to sleep”, and the participants having score of 8 to 28 were classified as “not having problems related to sleep”.

Approval of Institutional Ethical Committee was obtained vide Letter number SU/2022/3108(58)

RESULTS

The study was conducted among 416 women belonging to the age group of 15 to 45 years, maximum number of participants (161, 38.7%) belonged to 21 to 25 years of age and the least number of participants (21, 5%) belonged to 41 to 45 years of age. Most of participants (139, 33.4%) were graduates and least number of participants, 16, (3.8%) were educated up to primary school. The majority of participants (249, 59.9%) were unemployed. Among all the study participants, 143 (34.4%) belonged to the upper class, which was the most common category of socio-economic status and four (1%) participants belonged to the lower class. (Table 1)

Out of the total 416 participants, 282 (67.8%) females experienced dysmenorrhoea. Out of those 282 participants, 103 (36.5%) females had mild pain, 125 (44.3%) had moderate pain while 54 (19.1%) experienced severe pain. It was observed that maximum number of participants (121, 42.9%) were not taking any measures for relief of pain. (Table 2)

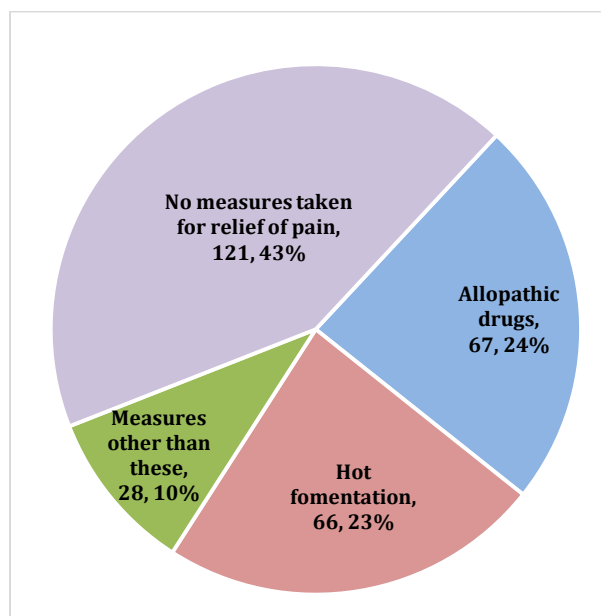


Figure 1: Distribution of the study participants (n=282) according to experience of menstrual pain, its severity and relief measures taken for it

A significant association of menstrual pain was observed with age of the participants, their age at attainment of menarche, experience of pre-menstrual symptoms, passage of clots, consumption of refined flour, fried food, preservatives, soda containing drinks, having habit of food restriction and doing moderate physical activities.

There was no significant association ($p > 0.05$) of menstrual pain with consumption of salads and/or fruits, sweets, tea, and/or coffee, doing vigorous physical activities, walking for at least 10 minutes, and having problems related to sleep. (Table 3)

Table 1: Distribution of the study participants according to the relief measures taken for dysmenorrhoea

Parameters	Participants (%) (n=416)
Age Groups (Age in years)	
15-20	77 (18.5)
21 - 25	161 (38.7)
26 - 30	63 (15.1)
31 - 35	49 (11.8)
36 - 40	45 (10.8)
41-45	21 (5)
Education	
Illiterate	31 (7.5)
Primary School	16 (3.8)
Middle School	40 (9.6)
High School	53 (12.7)
Intermediate/Diploma	106 (25.5)
Graduate	139 (33.4)
Post Graduate	31 (7.5)
Occupation	
Professional	58 (13.9)
Semi Professional	33 (7.9)
Clerical/Shop/Farmer	11 (2.6)
Semi-Skilled worker	22 (5.3)
Skilled worker	17 (4.1)
Unskilled worker	26 (6.3)
Unemployed	249 (59.9)
Socioeconomic Status	
Upper	143 (34.4)
Upper middle	95 (22.8)
Lower middle	101 (24.3)
Upper Lower	73 (17.5)
Lower	4 (1)
Total	416 (100)

Table 2: Distribution of the study participants according to the experience of menstrual pain

Experience during menstrual	Participants (%) (n=416)
Experiencing pain during menstruation	
Yes	282 (67.8)
No	134 (32.2)
Total	416 (100)
Severity of pain experienced	
Mild pain	103 (36.5)
Moderate pain	125 (44.3)
Severe pain	54 (19.1)
Total	282 (100)

Table 3: Association of menstrual pain with lifestyle and other characteristics

Parameters	Pain during menstruation			Chi-Square value	Degree of freedom	p value
	Yes (%)	No (%)	Total (%)			
Age Groups (in years)						
15-25	176 (73.9)	62 (26.0)	238	12.7711	2	0.0016*
26-35	72 (64.3)	40 (35.7)	112			
36-45	34 (51.5)	32 (48.4)	66			
Attainment of menarche						
Early	105 (80.1)	26 (19.9)	131	14.6829	2	0.0006*
12-14 years	141 (63.8)	80 (36.2)	221			
Late	36 (56.2)	28 (43.7)	64			
Experiencing pre-menstrual symptoms						
Yes	220 (78.5)	60 (21.4)	280	45.606	1	0.001*
No	62 (45.6)	74 (54.4)	136			
Passage of clots						
Yes	90 (78.9)	24 (21.0)	114	8.955	1	0.003*
No	192 (63.6)	110 (36.4)	302			
Salads and/or fruits						
Yes	259 (67.4)	125 (32.6)	384	0.2651	1	0.606
No	23 (71.9)	9 (28.1)	32			
Refined flour						
Yes	219 (75.2)	72 (24.7)	291	24.7437	1	0.0001*
No	63 (50.4)	62 (49.6)	125			
Fried food						
Yes	215 (71.7)	85 (28.3)	300	7.411	1	0.006*
No	67 (57.8)	49 (42.2)	116			
Sweets						
Yes	208 (70.5)	87 (29.5)	295	3.436	1	0.064
No	74 (61.2)	47 (38.8)	121			
Preservatives						
Yes	162 (77.1)	48 (22.9)	210	16.995	1	0.0001*
No	120 (58.3)	86 (41.7)	206			
Tea and/or coffee						
Yes	237 (67.7)	113 (32.3)	350	0.006	1	0.941
No	45 (68.2)	21 (31.8)	66			
Soda containing drinks						
Yes	143 (78.6)	39 (21.4)	182	17.229	1	0.001*
No	139 (59.4)	95 (40.6)	234			
Habit of food restriction						
Yes	59 (77.6)	17 (22.3)	76	4.126	1	0.042*
No	223 (65.6)	117 (34.4)	340			
Heavy physical activities						
Yes	148 (70.1)	63 (29.9)	211	1.086	1	0.297
No	134 (65.4)	71 (34.6)	205			
Moderate physical activities						
Yes	163 (61.9)	100 (38.0)	263	11.0594	1	0.0008*
No	119 (77.8)	34 (22.3)	153			
Light physical activities						
Yes	123 (75.0)	41 (25.0)	164	1.181	1	0.277
No	10 (62.5)	6 (37.5)	16			
Having problems related to sleep						
Yes	73 (70.9)	30 (29.1)	103	0.597	1	0.44
No	209 (66.8)	104 (33.2)	313			
Total (%)	282 (67.8)	134 (32.2)	416			

The participants in age group of 15 to 25 years had 2.6 times higher chances of having dysmenorrhoea (OR - 2.672, CI - 1.522-4.691, p value -0.001). The participants who attained an early menarche had three times higher chances of dysmenorrhoea as compared to those had a late menarche (OR - 3.141, CI - 1.633-6.043, p value - 0.001). Study participants experiencing pre-menstrual symptoms had 4.3 times higher chance of dysmenorrhoea (OR - 4.376, CI - 2.813-6.809, p value - 0.001). Participants who experienced passage of clots during menstruation had

twice the chance of dysmenorrhoea (OR - 2.148, CI - 1.293-3.569, p value - 0.003). The participants who were consuming refined flour had 2.9 times higher chances of experiencing pain during menstruation (OR - 2.993, CI - 1.927-4.649, p value - 0.001). Those who were consuming fried food had higher chance of experiencing pain during menstruation (OR - 1.85, CI - 1.184-2.889, p value - 0.007). The participants who consumed food with preservatives and drank soda had 2.4- and 2.5-times higher chance of experiencing dysmenorrhoea (OR - 2.419, CI -1.582-3.699, p value -

0.001) and (OR - 2.506, CI -1.614-3.890, p value - 0.0001) respectively. Participants who had a habit of restricting food had 1.82 times higher chance of having dysmenorrhoea (OR - 1.821, CI - 1.015-3.265, p value - 0.044). It was seen that the participants who

had regular physical exercise had 2.1 times less chances of having dysmenorrhoea, with reference to those who did not do physical exercises (OR - 2.147, CI -1.362-3.385, p value - 0.001). (Table 4)

Table 4: Regression analysis of menstrual pain with respect to significant variables

Parameters	Pain during menstruation			Odd's Ratio	95 % CI	p value
	Yes (%)	No (%)	Total (%)			
Age Groups (in years)						
15-25	176 (73.9)	62 (26.0)	238	2.672	1.522-4.691	0.001*
26-35	72 (64.3)	40 (35.7)	112	1.694	0.913-3.144	0.095
36-45	34 (51.5)	32 (48.4)	66	1	Reference	Reference
Attainment of menarche						
Early	105 (80.1)	26 (19.9)	131	3.141	1.633-6.043	0.001*
12-14 years	141 (63.8)	80 (36.2)	221	1.371	0.779-2.412	0.274
Late	36 (56.2)	28 (43.7)	64	1	Reference	Reference
Experiencing pre-menstrual symptoms						
Yes	220 (78.6)	60 (21.4)	280	4.376	2.813-6.809	0.001*
No	62 (45.6)	74 (54.4)	136	1	Reference	Reference
Passage of clots						
Yes	90 (78.9)	24 (21.1)	114	2.148	1.293-3.569	0.003*
No	192 (63.6)	110 (36.4)	302	1	Reference	Reference
Refined flour						
Yes	219 (75.2)	72 (24.7)	291	2.993	1.927-4.649	0.001*
No	63 (50.4)	62 (49.6)	125	1	Reference	Reference
Fried food						
Yes	215 (71.7)	85 (28.3)	300	1.85	1.184-2.889	0.007*
No	67 (57.8)	49 (42.2)	116	1	Reference	Reference
Preservatives						
Yes	162 (77.1)	48 (22.9)	210	2.419	1.582-3.699	0.001*
No	120 (58.3)	86 (41.7)	206	1	Reference	Reference
Soda containing drinks						
Yes	143 (78.6)	39 (21.4)	182	2.506	1.614-3.890	0.0001*
No	139 (59.4)	95 (40.6)	234	1	Reference	Reference
Having habit of food restriction						
Yes	59 (77.6)	17 (22.3)	76	1.821	1.015-3.265	0.044*
No	223 (65.6)	117 (34.4)	340	1	Reference	Reference
Moderate Physical activities						
Yes	163 (61.9)	100 (38.0)	263	2.147	1.362-3.385	0.001*
No	119 (77.8)	34 (22.3)	153	1	Reference	Reference

DISCUSSION

In the present study, the prevalence of dysmenorrhoea was found to be 67.8%. Similar results were observed in a study conducted by Ayokunle Osonuga et al in Ghana in 2019 where the prevalence of dysmenorrhoea was reported as 74% among undergraduate students.¹³ In a study, by Jerilee Mariam Khong Azhary et al in 2022 in Malaysia, the prevalence of dysmenorrhoea was found to be 85% among adolescent girls.¹⁴ Onieva-Zafra et al reported the prevalence of dysmenorrhoea as 88.7% among Spanish university students in 2020.¹⁵ Similarly, Durai Vanitha et al reported the prevalence of dysmenorrhoea as 75% among women of reproductive age group in 2017 in Tamil Nadu.¹⁶ These results indicate that dysmenorrhoea is common problem among women.

In our study, out of the total 282 study participants experiencing dysmenorrhoea, majority of participants, 125, (44.3%) suffered moderate pain, 103 (36.5%) participants were experiencing mild pain

and 54 (19.1%) participants experienced severe pain. This result was similar to a study conducted by Zhao Hu et al, in China in the year 2020, in which out of the total participants experiencing dysmenorrhoea, 35.1% were experiencing mild dysmenorrhoea, 51% were experiencing moderate dysmenorrhoea and 13.8% were experiencing severe dysmenorrhoea.¹⁷ However, MoolRaj Kural et al in 2015 in Madhya Pradesh observed mild dysmenorrhoea among 29.2%, moderate dysmenorrhoea among 36.6% participants and severe dysmenorrhoea among 34.2% participants.¹⁸

It was observed that maximum number of participants (121, 42.9%) were not taking any measures for pain relief while 67 (23.7%) were taking allopathic medications. According to the study done by Patrícia Marques et al among adolescent girls in Portugal in 2022, 54% of the dysmenorrhoeic participants took analgesic medications.¹⁹ CF Chia et al in 2013 in Hong Kong observed that among 240 university students who were having dysmenorrhoea, 6% consulted

health care workers and 70% practiced self-management for it.²⁰ This difference of health care seeking behaviour observed in our study maybe because in India, menstruation related issues have significant stigma attached to them.

Participants of age group 15 to 25 years had a 2.6 times higher chance of dysmenorrhea as compared to those of age group 36 to 45 years. Similar findings were observed by the study done MoolRaj Kural et al in which it was found that among college going girls, the maximum number of girls having dysmenorrhea were of age group of 19 to 20 years.¹⁸ Likewise, S. Ohde et al in Japan reported a significant association of dysmenorrhea with the age of participants less than 30 years.²¹ It is reported that menstrual pain decreases after childbirth;²² this may be a reason for above findings.

In the present study, those participants who had attained an early menarche had 3.1 times increased chance of experiencing menstrual pain. Similarly, Zhao Hu et al in 2020 in China and Zofia Barcikowska et al in 2020 in Poland reported that presence of dysmenorrhea was associated with attainment of menarche before 12 years of age.^{17,23} This phenomenon may be attributed to increased release of prostaglandins and an increased uterine activity.⁵ It was observed that the participants who experienced premenstrual symptoms had 4.3 times higher odds of experiencing pain during menstruation. Similar findings were observed in a study conducted by Aditya Prasad Sarkar et al in 2016 in West Bengal and K. Bhuvaneswari et al in 2019 in Puducherry. They observed that the presence of premenstrual symptoms had a significant association with the presence of dysmenorrhea.^{24,25} Our study found that the participants who experienced passage of clots during menstruation had 2.1 times more chances of experiencing dysmenorrhea. MoolRaj Kural et al in 2015 in Madhya Pradesh reported a significant association between dysmenorrhea and passage of clots.¹⁸ Presence of clots has been associated with heavy menstrual bleeding, resulting in an increased release of prostaglandins which further causes dysmenorrhoea.

We observed that the participants who were consuming refined flour, fried food, preservatives and soda containing drinks had significantly higher chances of experiencing pain during menstruation. Priyanka Negi et al in 2018 in Garhwal and Nirmala Jaget Lakkawar et al in 2014 in Puducherry reported that dysmenorrhea was significantly more common in those subjects who were consuming more of unhealthy food.^{2,26} Junk food is rich in saturated fatty acids which have found to affect the hormone metabolism in menstruation.²⁷ However, Rupa Vani K et al found no significant association between menstrual pain and consumption of unhealthy food.⁶ It was seen that the participants who were skipping meals had 1.8 times more chances of having menstrual pain. Likewise, Rupa Vani K et al in 2013 in Puducherry observed that the girls who were restricting food for weight loss purpose had a higher

chance of dysmenorrhea.⁶ This could be because the participants who were skipping their food may not be getting essential nutrients.

In the present study, the participants who did moderate physical exercises had 2.1 times less chances of having dysmenorrhea. Likewise, Zofia Barcikowska et al observed that dysmenorrhea was associated with low level of physical activity.²³ Exercise may be a protective factor for menstrual pain. The release of endorphins during physical exercise⁶ may contribute to it.

One of the major limitations of the study was that the findings were based on the participants' self-reporting, which can potentially give rise to biases, especially recall bias. Hence, better and objective ways of collecting data are suggested in future studies, such as daily trackers for diet and physical activity. Secondly, no investigations were performed among the participants reporting dysmenorrhea, leading to lack of clarity between primary and secondary dysmenorrhea. Inclusion of investigations like ultrasonography would have led to a better clarity of underlying issue for dysmenorrhea. Moreover, the study was conducted only among the urban population, and assessment of the rural population is required as well.

The findings may have been affected by the presence of confounding factors, such as age, ethnicity, urbanisation, geographical location. Further studies are recommended to obtain finer aspects of this research question.

CONCLUSION

The prevalence of dysmenorrhea in this study came out to be quite high in our study. Factors found to be associated with dysmenorrhea were consumption of unhealthy food, skipping meals and lack of physical activity. An improvement of lifestyle may be required to deal with this modern age problem. However, follow up studies may be required to conclude the finer aspects of our findings. Consciousness among the general public towards dietary habits and physical activity, as well as health education by healthcare and educational institutes regarding menstrual health is recommended.

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