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A Survey on Factors Influencing Dysmenorrhea Among Women in Kanchipuram District Tamil Nadu

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ABSTRACT

Dysmenorrhea, a prevalent gynecological disorder characterized by painful menstrual cramps, often signals dysfunction within the hypothalamic-pituitary-ovarian axis and may be associated with pelvic inflammation. It significantly affects the quality of life of young women and is influenced by various lifestyle, nutritional, and psychological factors . This study aimed to evaluate the prevalence and severity of dysmenorrhea among college-aged women aged (19-26) years in Kanchipuram District, Tamil Nadu, and to identify the contributing factors such as dietary habits, sleep patterns, stress, skipping breakfast, part-time jobs, sleeping, genetic factors, being an athlete, age, profession, being vegetarian or non-vegetarian, fruit intake, fast food consumption, junk food consumption, age at first menstruation, having regular or irregular periods, and use of painkiller drugs were examined for their influence on dysmenorrhea among college students in Tamil Nadu. Data were collected by a self-administered questionnaire contains the demographic variables, menstrual history, severity of dysmenorrhea, and associated lifestyle factors including breakfast habits, fast food consumption, physical activity, and family history. Menstrual patterns were analyzed manually and with statistical tools. The results revealed that menstrual patterns in college going students were abnormal (41%) irregular periods (22%) and abnormal in bleeding (76%) were recorded. The present study concludes that the various factors like, skipping breakfast, food quality, part time job, sleeping, mental stress, fast food, junk food, and anemia were influencing Dysmenorrhea. The findings suggest that poor dietary habits, particularly breakfast skipping and fast-food intake, along with other modifiable lifestyle factors, are strongly associated with the prevalence and severity of dysmenorrhea. Health education and intervention programs focusing on nutrition and menstrual hygiene awareness are essential to improve reproductive health and quality of life among young women.

Keywords: *Dysmenorrhea, Menstrual Disorders, Adolescents, Health promotion, Skipping Breakfast, and Food Quality*.

1. INTRODUCTION

Dysmenorrhea is an important sign of functional disturbance in the hypothalamic-pituitary-ovarian axis and subsequent local inflammation in the pelvic cavity (Kennedy, 1996; Deligeoroglou, 2000 and Lundstrom and Green, 1978). Which also is an excellent parameter that reflects female psycho-physiological status. It begins within 6-12 months from the menarche and is characterized by localized pain in the abdominal inferior quadrants. Dysmenorrhea, defined as painful

cramps that occur with menstruation, is the most common gynecologic problem for women of all ages and races and one of the most common causes of pelvic pain (Voto and Essig, 1984) Dysmenorrhea, classified as primary dysmenorrhea and secondary dysmenorrhea, is a common gynecological symptom that seriously affects female daily life. At present, studies on dysmenorrhea are numerous and complex Dong *et al*., (2023). Dysmenorrhea is an important initial symptom for endometriosis, which causes local inflammation with pelvic pain and infertility. (Kennedy, 1996; Deligeoroglou, 2000; Lundstrom and Green, 1978).

To predict dysfunction in the hypothalamic-pituitary ovarian axis, irregular menstruation is one of the positive clinical symptoms. Therefore, increasing attention has been paid to abnormality of the menstrual cycle in various fields. One of the most common nutritional issues among young women in India is poor energy intake and/or inappropriate food selection due to dietary limitations for cosmetic purposes, which can lead to poor intake of protein, carbohydrate and essential fatty acids along with diet-related psychological stress (Carpenter, 1994). These factors are speculated to influence not only the present life style but also future medical disorders such as cardiovascular and metabolic diseases (Renaer *et al*., 1979 and Alonso *et al*., 2001). Furthermore, menstrual and reproductive factors have also been proposed to be associated with malignant diseases in the uterus as well as in other organs (Lloyd *et al*., 1991).

Dietary habits are fundamental factors that influence human life styles and individual quality of life (QOL). Dietary habits in young women may determine their QOL in subsequent middle or old age and should be evaluated from the perspective of total benefit throughout whole life. In India, widespread consumption of fast food, skipping of food intake, and the shift from Indian to Western foods are increasing among young women (Fujiwara *et al*., 2007).

Accordingly, it is important to evaluate the present situation of eating habits in young women and estimate their influence on menstrual disorders. Although epidemiologic evaluation of menstrual cycle is an important, it is difficult to precisely determine the normal length of menstrual cycles in individuals with cyclic variability because there is considerable variation in menstrual cycles among women (Harlow and Campbell 2004). When researchers strictly exclude women with irregular menstrual cycles, they tend to rigidly select the group with a narrow range of menstrual cycles as normal menstrual intervals from 25-28 to 32 days (Battaglia *et al*., 2006).

Based on this background, we think that the proposal of standard normal menstrual function for epidemiologic evaluation is necessary for adequate assessment of young women health. In addition, the relationship between food customs and menstrual dysfunction has been becoming important issue in the world. Therefore, the present study aimed at to study the Dysmenorrhea, Pre-menstrual syndrome, regular or normal menstruation, influence of food intake, junk food, part time job, sleep, genetic factors and other disease on menstrual disorders in young women.

2. MATERIALS AND METHODS

Data were collected by a self-administered questionnaire composed of demographic characteristics including gender, age, parents' educational level, and living arrangements. The subjects were 200 women aged 19-26 years in Kanchipuram across different academic years who were present at the time of the study. The researchers explained the study's aim and questionnaire contents to each participant and requested voluntary participation. Subjects with a history of abdominal or pelvic surgery were ineligible. All participants provided written informed consent before enrollment. The 30-item anonymous questionnaire gathered data on demographics, age at menarche, menstrual patterns, dysmenorrhea severity and associated symptoms, the impact of menstrual disorders on social activities, sports, class attendance, pain management strategies, knowledge sources about menarche, and whether medical assistance for menstrual issues was sought. Students identified the year of their first period.

Institutional ethical approval was obtained from the authorities. Researchers introduced the study to subjects in Tamil (the local language). They first obtained verbal and written consent from the principals, then the students. Confidentiality was maintained by assigning identification numbers to each participant. The study included only unmarried, healthy undergraduate women aged 18-26 who volunteered. Written consent was obtained before data gathering began.

This cross-sectional study aimed to determine: (i) associations between menstrual cycle patterns and menarche age; (ii) the prevalence of disorders including menstrual irregularity, dysmenorrhea, and prolonged bleeding; (iii) knowledge sources and management strategies for menstrual issues, especially dysmenorrhea; and (iv) the effect of menstrual disorders on participants' social activities. Dysmenorrhea was defined as any menstrual pain or discomfort. Severity was categorized as mild, moderate or severe based on pain, activity limitation, and medication use. Severe dysmenorrhea clearly inhibited daily activities, caused systemic symptoms, and responded poorly to analgesics. Menstrual cycles ranging 21–35 days, with a mean of 28±2 were considered regular. Cycles shorter than 21 days or exceeding 35 days were deemed irregular. Data were subjected to Chi-Square Test of Independence in MS-Excel.

3. RESULTS AND DISCUSSION

This study was conducted in Kanchipuram, Tamil Nadu, India from December 2013 to March 2014. The objectives were to observe menstruation-related problems over the last three cycles. The following observations were made:

A total of 200 women aged 19-26 years were randomly selected and interviewed using a self-structured questionnaire. The youngest age at menarche was 9 years and the oldest was 15 years, with a mean of 12.6 ± 1.0 years and a median of 13 years. Menarche occurred at age 13 for 64 (36.8%) respondents. Menstrual cycles were regular for 115 (78.0%) respondents and irregular for 32 (22.0%). (Table. 1).

Table.1. Factors influencing dysmenorrhea among women students (Age 19-26)

Factors	Percentage(%)	Total No. of. Responded
Food Habitat		
Vegetarian	27	39
Non. Vegetarian	73	108
Fruit intake		
Daily	7	10
Once in a Week	51	75
Twice in a Week	34	50
Once in a Month	8	12
Skipping Breakfast		
Daily	10	16
One Day in a week	63	92
2-6 Days	12	17
Not at al	15	22
Food Habitat		
Fast Food	2	3
Junk Food	3	5
Burger	1	2
Chips	33	48
Puffs	27	40
Softdrinks	16	23
All the above	18	26
Sleep Quality		
Normal	59	86
Abnormal	41	61
Genetic Factors		
Sugar	2	3
Asthma	16	24
Non -Genetic	82	120
Menarche		
Normal	93	137
Abnormal	7	10

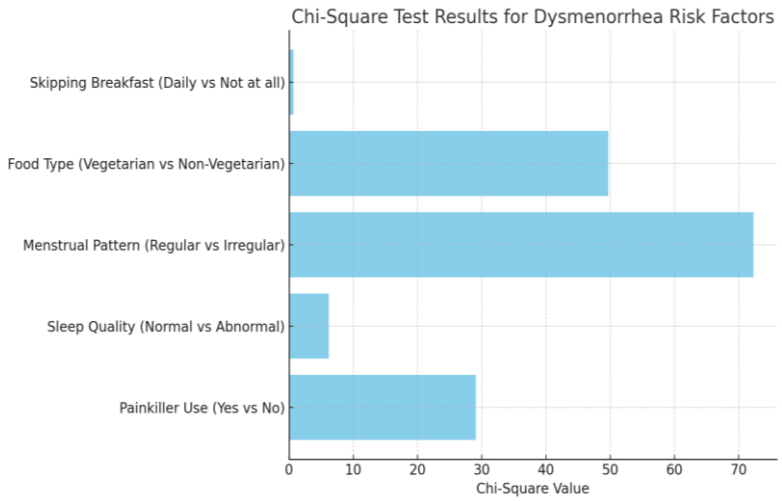
Menstrual Pattern		
Regular	78	115
Irregular	22	32
Bleeding		
Normal	24	35
Abnormal	76	112
Pain Killer required		
Yes	32	47
No	68	100
Vomiting		
Yes	58	85
No	42	62
Premenstrual Syndrome		
A	15	22
B	61	90
C	7	11
D	15	21
Nil	2	3
	College	
Day Scholar	90	133
Hosteller	10	14
Travelling		
More than one Hour	63	93
Less than one Hour	37	54
Part Time Job		
Yes	14	21
No	86	126
Physical Work	21	30
Athlete	10	15
Nonphysical	69	102
Anemic	66	97
Non Anemic	34	50
	Urination	
Severe Pain	52	76
Non -Severe Pain	48	71

Painful Urination	54	79
Non Painful Urination	46	68
Heavy Sweating		
Yes	71	105
No	29	42
Dizziness		
Yes	73	108
No	27	39
Breasts Swollen/ Hardness		
Yes	63	93
No	33	54
Summer/Winter		
Yes	14	21
No	86	126
Weight Loss/Gain		
Yes	55	81
No	45	66
Pain in Bleeding		
Yes	62	91
No	38	56
Mood Swings		
Yes	59	87
No	41	60
Abdomen Belly Feels Full		
Yes	50	74
No	50	73
Muscular Pain/Joint Pain		
Yes	84	124
No	16	23

Regarding menstrual cycle regularity, 115 (78.0%) had regular cycles, while 32 (22.0%) were irregular. Four respondents had cycles over ninety days. Menstrual flow was average for 100 (57.5%) respondents, scanty for 72 (41.4%), and heavy for 2 (1.1%). These findings are similar to those of Chowdhury *et al*., (2000).

A substantial number (100 or 57.5%) reported dysmenorrhea of varying severity. Of those, 30 required medical intervention with analgesics and/or antispasmodics. This aligns with Chowdhury *et al*., (2000). Moreover, 56 (52.8%) dysmenorrhea sufferers had a family history.

Menstrual Flow was average for 100 (57.5%), scanty for 72 (41.4%), and heavy for 2 (1.2%). At least 106 (60.9%) had painful periods of differing severity. Of those, 26 (24.5%) used medication. Around 56 had a family history of dysmenorrhea.



The following table 2. shows the statistical association between selected binary factors and dysmenorrhea using the Chi-Square Test of Independence.

Factors	**χ^2(Chi-Square)**	**p-value**	**Significance ($\alpha = 0.05$)**
Skipping Breakfast (Daily vs Not at all)	0.73	0.394	**Not Significant**
Food Type (Vegetarian vs Non-Vegetarian)	49.73	< 0.00001	**Highly Significant**
Menstrual Pattern (Regular vs Irregular)	72.32	< 0.00001	**Highly Significant**
Sleep Quality (Normal vs Abnormal)	6.2	0.013	**Significant**
Painkiller Use (Yes vs No)	29.08	< 0.00001	**Highly Significant**

Chi-square analysis revealed significant associations between dysmenorrhea and several lifestyle and physiological factors. Menstrual pattern irregularity showed a highly significant association with dysmenorrhea ($\chi^2 = 72.32$, $p < 0.00001$), indicating that women with irregular cycles are more likely to experience painful menstruation. Similarly, food habits, particularly being non-vegetarian, were significantly linked with dysmenorrhea ($\chi^2 = 49.73$, $p < 0.00001$), suggesting dietary components may influence hormonal or inflammatory responses. Painkiller use was also significantly higher among those with dysmenorrhea ($\chi^2 = 29.08$, $p < 0.00001$), reflecting symptom severity and reliance on medication. Additionally, poor sleep quality was moderately associated ($\chi^2 = 6.20$, $p = 0.013$), implying a potential role of sleep disruption in exacerbating symptoms. In contrast, the difference between those who skipped breakfast daily versus not at all was not statistically significant ($\chi^2 = 0.73$, $p = 0.394$), although further granularity in breakfast frequency may reveal subtler effects. These findings underscore the multifactorial nature of dysmenorrhea and highlight key areas for lifestyle-based interventions.

Dysmenorrhea was graded as previously described (Fujiwara, 2003): Grade 1 (free of pain or painful, but can manage without an analgesic), Grade 2 (painful, requiring an analgesic), and Grade 3 (painful, not relieved by an analgesic). Regular menstruation was strictly defined as constant 26–32-day intervals in each menstrual cycle, as previously described (Fujiwara, 2007)

The students were requested to detail their experiences of 10 symptoms and signs during the premenstrual phases: psychological disorders such as irritability, depression, nervousness, and mood swings and/or somatic complaints such as abdominal bloating, peripheral edema, lumbago, headache, general fatigue, and acne (Smith and Schiff, 1989). In this study, when the students experienced one or more of the above symptoms that rapidly disappeared just after the onset of menstruation for at least three or more sequential menstrual cycles.Though not clinically examined, recent annual surveys initially hypothesized that skipping breakfast associates with more severe dysmenorrhea versus eating breakfast (Fujiwara, 2003).

Low intake of protein, fish, vitamins B12/D, omega-3 fatty acids, and adherence to Mediterranean or anti-inflammatory diets show protective effects against severe dysmenorrhea.(Itani, R., et al. (2024); Belayneh, et al. (2023); Short sleep duration and irregular eating patterns (skipping breakfast, frequent processed food consumption) correlate with higher dysmenorrhea risk. Franco-Antonio, et al. (2025) Family history, early menarche, menstrual irregularity, caffeine, and stress emerged as significant risk/protective factors. Dwivedi, et al .(2023) Samal, et al. (2025).

Our questionnaire survey results revealed that women with a high intake of fast food and processed foods had a significantly higher incidence of dysmenorrhea (Fujiwara & Nakata, 2009). Since the population of this study is limited at two colleges located close together, it is reasonable to consider that the educational, economic and cultural backgrounds of these students are similar. Taken together, it is suggested that dietary habits can adversely affect uterine function. It is well known that inappropriate dieting often induces amenorrhea in young women and may cause ovarian dysfunction during the subsequent reproductive years (Branca, 1999; Koebnick *et al*., 1999). It was also reported that a vegetarian low caloric diet led to menstrual cycle disorders with a short luteal phase (Lloyd *et al*., 1991; Pedersen *et al*., 1991).

Accordingly, it is widely accepted that irregular menstruation in young students is partially caused by an inadequate nutritional state, inducing dysfunction in the hypothalamic– pituitary–ovarian axis (Montero *et al*., 1996). Defining regular cycles as 26-32 days showed significantly more irregularity with breakfast skipping. These are the first indications that skipping breakfast could adversely affect ovarian function. Premenstrual symptoms also associated with more menstrual pain, suggesting links between premenstrual syndrome and dysmenorrhea that may indicate underlying conditions (Fujiwara & Nakata, 2007).

Although these findings provide a warning that various organic diseases causing dysmenorrhea may latently develop in young Indian women with premenstrual symptom.The group that skipped breakfast showed a tendency to suffer from constipation, suggesting that skipping breakfast may generate some stress in young women. Notably, despite the absence of a significant difference in body mass index, there was a significantly larger population with a self-perception of poor general health among the group that skipped breakfast (Fujiwara & Nakata, 2007). In our recent study, post adolescent female college students with high intakes of fast food and processed food did not complain of self-perceived poor general health or increased episodes of irregular menstruation.

Consequently, the findings of this study suggest the possibility that dietary restriction in adolescence becomes a trigger for the subsequent development of organic gynecologic diseases, supporting the concept that inadequate dietary habits may influence women's QOL not only in the present but also in the future (Fujiwara, 2007). A recent study reported that skipping breakfast and taking meals irregularly are associated with the prevalence of fatigue in Japanese medical students (Tanaka *et al.,* 2008). It was also found that skipping breakfast is associated with increased blood pressure in adolescents (Kollias *et al*., 2009).

Accordingly, attention is increasingly paid to the adverse effects of skipping breakfast by pre-adolescents, but also in adolescents (Pearson, 2009). However, there are very few reports on the effects of skipping breakfast on reproductive function, especially in post-adolescents. In this regard, our findings are informative in that they show for the first time the possibility that skipping breakfast is associated with menstrual disorders in female postadolescents. However, a hypothesized causal relation between breakfast skipping and dysmenorrhea cannot be validated by the findings of this study. Such validation will require a prospective study and/or animal experiments.

Although the precise mechanisms behind the above findings are unclear, our preliminary animal experiments showed that greater impairment of the estrus cycle in young female rats that were starved during the day, i.e., the daytime (nonactive phase) than those that were starved at night (active phase), suggesting that the timing of food consumption in daily life is an important issue that affects reproductive function in the young (unpublished data). Supporting our findings, it was very recently reported that the timing of food intake itself may play a significant role in weight gain Obesity (Arble & Turek, 2009).

This study focused on the role of the circadian phase of food consumption in weight gain and found that nocturnal mice fed a high-fat diet only during the 12-h light phase gained significantly more weight than mice fed only during the 12-h dark phase, suggesting that the circadian system is an important factor in the effects of food intake. Taken together, we now speculate that failure to eat at the start of daily activities, as observed in students who skip breakfast, is an important factor that causes reproductive and non-reproductive disorders in young women.

Pre-menstrual syndrome (PMS) is recurrent variable cluster of trouble some physical and emotional symptoms that develop 7–14 days before the onset of menstruation and subsides when menstruation occurs. The PMS consists of low backache, fatigue, breast heaviness, abdominal bloating, increased weight, headache, irritability, skin disorders, aggressiveness, depression, gastrointestinal symptoms and loss of appetite (Amita singh *et al*., 2008).

Adolescence is a time of enormous physical and hormonal change for a young girl. Although organic gynecological pathologies are rare in this period, menstrual disorders may be seen commonly, and may cause further problems for the adolescents and their parents. The age of menarche is determined by general health, genetic factors, socioeconomic and nutritional status. It is typically between 12 and 13 years; but with the improvements in the nutritional status and general health it has declined in many populations during the last decades. In this study the age at menarche was 9-15 years. This

may be related to improvement of nutritional and socioeconomic status of the adolescents in recent decades. Median age at menarche was 13 years which is very much related to findings of study conducted by Grover *et al.,* 2000; Singh *et al.,* 2001 and Hedge *et al.,* 2003).

Problems with menstrual pattern may affect 75% of girls, and are the major cause of recurrent short-term school absenteeism in female adolescents. Menstrual irregularity and prolonged menstrual bleeding are the most common menstrual disorders in early adolescents. Prolonged menstrual bleeding usually occurs early after menarche due to anovulatory cycles. In anovulatory cycles, estrogen unopposed by progesterone produces an unstable endometrial lining that eventually breaks down, and vasoconstriction and myocardial contractility do not occur.

4. CONCLUSION

This study provides valuable information about irregular breakfast eating among adolescents, which is associated with being overweight and with a low frequency of health promoting behavior. The Chi-Square Test of Independence revealed several significant associations with dysmenorrhea. A highly significant link was found with menstrual pattern irregularity ($\chi2=72.32$, $p<0.00001$), indicating a higher likelihood of painful menstruation in women with irregular cycles. Food habits, particularly being non-vegetarian, also showed a highly significant association ($\chi2=49.73$, $p<0.00001$), suggesting dietary influences on hormonal or inflammatory responses. School and family health promotion strategies should be used to encourage all adolescents to eat breakfast regularly. To our knowledge, these findings are the first evidence to suggest that skipping breakfast can adversely affect ovarian function in College going women. Given the high prevalence of dysmenorrhea and menstrual irregularities , along with the identified associations with various modifiable lifestyle factors, the study underscores the importance of health education and intervention programs. These programs should focus on promoting healthy dietary habits, including regular breakfast consumption, and raising awareness about menstrual hygiene to improve the reproductive health and overall quality of life among young women

Declaration of interests

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Authors contributions

RA & BR conceived the idea, designed the study; BR did the field surveys and experimental work, and MB &JS did the data analyses and drafted the manuscript. This Manuscript was Edited and reviewed by RA.

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