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INFLUENCE OF NUTRITION ON MENSTRUAL STATUS AMONG ADOLESCENT GIRLS (12 - 18 years)

Anu Gayathri[•]
Geetha Santhosh*[••]

Abstract

Introduction: Adolescence is a crucial period of growth spurt and physical development of the body in every human being as it marks the beginning of adulthood. Menstruation embarks the journey of an adolescent girl into a healthy reproductive woman.
Aim: The aim of the study was assessment of nutritional status, menstruation, factors influencing menstruation in adolescent girls.
Methodology: A total of 100 girls (12 – 18 years) were screened, 83 girls who had attained their menarche were assessed using a self-structured questionnaire at Non-Governamental Organisation run school in Sahakaranagar, Bengaluru.
Results: Majority (53%) of the study population had a normal BMI, 28% were underweight and 11% were overweight with mean menarchal age of 12 ± 0.3 years. Body mass index of the adolescent girls influenced their menarchal age (p = 0.003*) however it did not influence the regularity of menses and duration of menstrual cycle. Age at menarche did not influence duration of menses. Nutrient intake assessed using 24-hour recall and Food Frequency Questinnaire reflected low nutrient intake. The most common Pre-Menstral Syndromes experienced were back pain and abdominal cramps while 93% had dysmenorrhea.
Conclusion: The study concluded that underweight girls attained late menarche compared to overweight girls and poor nutrition affects the severity of menstrual disorders. Hence proper education on role of nutrition during menstruation should be imparted for their betterment.
p<0.05 – Significant

Keywords:

Adolescence;
Menstruaton;
Body Mass Index;
Pre-Mestrual Syndrome;
Nutrition.

Author correspondence:

Anu Gayathri,
Student, Department of Nutrition and Dietetics
Mount Carmel College, Bengaluru

1. Introduction

Adolescence is the important phase of transition of physical and psychological human development in every human being. Nutrition, a major component of health, plays a pivotal role in adolescents' growth and development. Adequate nutrient intake and nourishment is essential for adolescent girls for a healthy reproductive future. Nutritional inadequacy has

[*]Student, Department of Nutrition and Dietetics,Mount Carmel College,Bengaluru
[**]Associate Professor, Department of Nutrition and Dietetics,Mount Carmel College,Bengaluru

been one of the main causes for the prevalence of malnutrition that can lead to higher incidences of diseases and menstrual disorders in adolescents.

Adolescence in girls begins with pubescence or puberty and this leads to the complete change in the morphology and physiological transformation of the adolescent into an adult. Puberty in adolescent girls usually begins from 8 – 13years and last for a few years. Menarche indicates the growth and development of the physical characteristics. Menstruation is the periodic blood that flows as a discharge from the uterus. The age of normal menarche may vary from 12-16 years of age. The length of the normal menstrual cycle varies from 21-35 days. The BMI and the body fat composition play a key role in the onset of menarche. The change in the body size and physical characteristics makes it difficult for majority of the girls to adjust to it due unfamiliarity. The matured girl undergoes many problems relating to menstruation.

The common five conditions considered as menstrual disorders are – Pre-Menstrual Syndrome (PMS), Amenorrhea, Dysmenorrhea, Oligomenorrhea, Polymenorrhea, Menorrhagia.

Adolescent girls who have attained their menarche not only have less knowledge about menstrual disorders, but also inadequate knowledge about the importance of nutrition to prevent diseases related to the reproductive system.

Thus, to improve the knowledge and health status of the future mothers, it was vital to assess the nutritional status and educate them. Enhancing proper and healthy eating habits will improve the well-being of the adolescents considerably. With better nutritional status and knowledge on menstruation, adolescent girls will be able to combat menstrual disorders and lead a healthy lifestyle.

2. Research Method

A purposive sample selection was employed to select the adolescent girls who have attained menarche as per the defined inclusion and exclusion criteria of the study. A pre-designed interview schedule method was used to collect the data from the participants, which consisted of personal information,anthropometry**,** nutrition knowledge and menstruation.

Assessment of the nutritional status was done using anthropometric measurements, 24-hour dietary recall with Quick diet reckoner which was developed to help in the assessment of nutrient intake andFood Frequency Questionnaire. Right nutrition software was the tool used to assess 24 hour diet assessment.The diet recall was done for 3 days which included two weekdays and one weekend. Assessment of menstruation was done by a personal interview method to determine the menstrual problems faced by the subject. Regarding the menstrual disorders, the subjects were asked about the symptoms that occur prior and during the menstrual cycle, regularity of the periods, fluctuations in the menstrual cycle, length of period cycle and the menstrual flow.

The assessment of the intensity of the pain during menstruation was assessed by using the Universal Pain Assessment Tool on a scale of 0 – 10, where 0 was for no pain and 10 was noted as the worst pain possible.

Analysis of the data was done using Mean, Standard deviation and Chi square test.

3. Results and Analysis

A total of 100 adolescent girls between the age group 12-18 years in the NGO were screened and 83 girls who had attained their menarche were selected for the study. The subjects were assessed on nutritional status, menstruation and factors influencing menstruation.

Baseline information on age and food habits of the study population was elicited. 59% and 41% of the subjects were in the age range of 12-15 years and 15-18 years respectively with a mean age of 15years. The mean BMI of the study population was 20.7kg/m^2, a clear indication that the study population was in the

normal weight category. It was observed that 53% (44) of the subjects were well nourished and had a normal BMI. However, 28% (23) of the girls were underweight and 13% (11) girls were overweight.
The mean age at menarche was found to be 12 ± 0.3 years. It was noted that 31 girls and 18 girls attained menarche at the age of 13years and 12years respectively. A total of 22 subjects had early menarche (≤11years) while 12 subjects had late menarche (>13 years).
The mean menarchal age in the present study was 12 ± 0.3 years, similar to a study conducted on 879 girls where the mean menarchal age was 12.7± 1.3 years [1].
A significant number (59) of subjects experienced pre-menstrual symptoms. The most common symptoms that were experienced by the study population were back pain (36) and body pain (31). Majority of the subjects experienced more than one symptom prior to menstrual cycles. Most of the girls in the study population experienced dysmenorrhea i.e. painful menses as seen in Fig 1. A total of 32 subjects experienced moderate pain that interfered with their work. Some of the girls also experienced mild pain, severe pain and worst pain possible. However, 6 girls reported no pain during their menstrual cycle.

87% of the adolescent girls experienced discomfort during menstruation. More than 50% of the study population experienced weakness and 29% experienced abdominal pain. Irrespective of the BMI of the samples, majority of them stated eumenorrhea (regular periods), 35% of the girls had polymenorrhea.
BMI play an important role in the onset of menarche. Higher the BMI, earlier the menarche and lower the BMI, later the menarche.

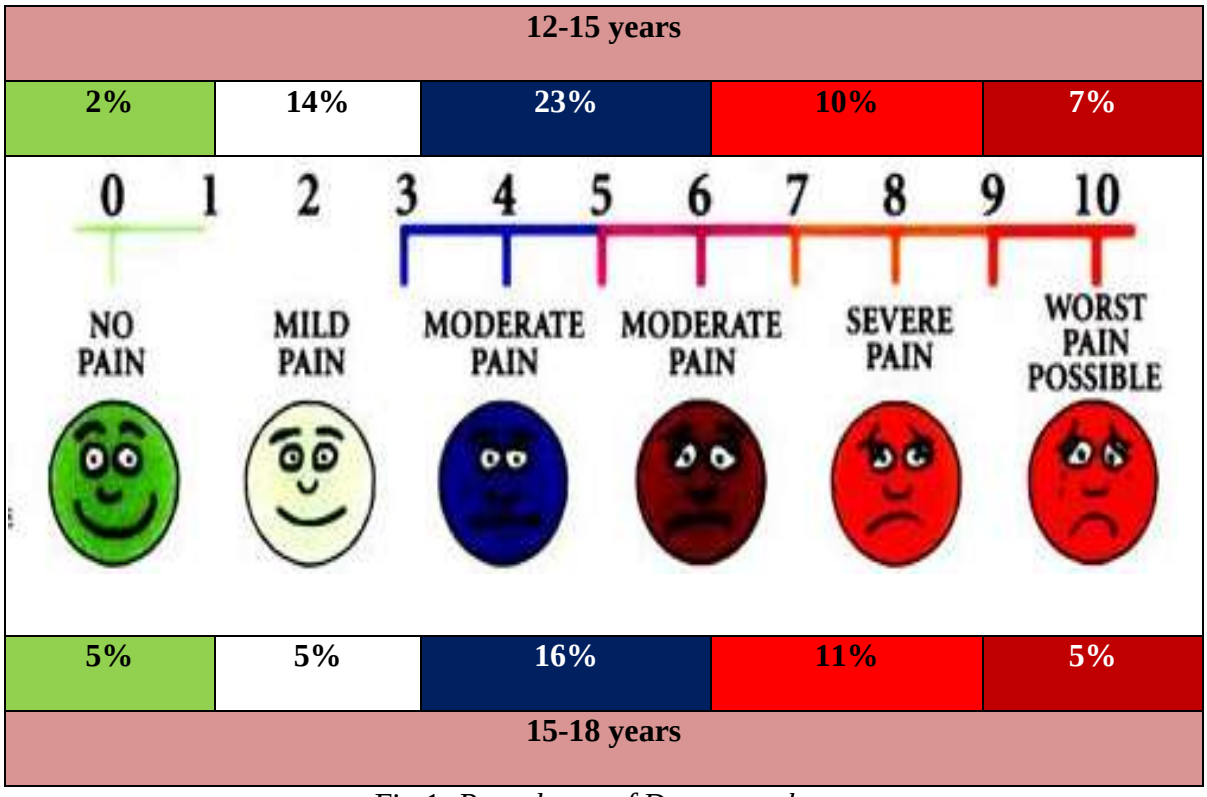

Fig 1: *Prevalence of Dysmenorrhea*

Table 1 represents the influence of BMI on the age at menarche. Maximum number of girls with a normal BMI had attained their menarche between the 12 and 13 years. Whereas, the girls with a BMI less than 18.5 had late menarche while subjects with BMI greater than 25 had early menarche. As indicated in the results, BMI of the subjects had highly influenced the onset of menarche and thus there was a significant relationship between the BMI and age at menarche.
The BMI of the individuals did not influence the regularity and the length of their menstrual cycle. Irrespective of the BMI, 41 respondents had regular periods and 42 respondents had irregular period cycle.
It was evident that 95% of the subjects associated the meaning of nutrition with growth and development of the body.

Table 1: Association of BMI and menarche

BMI Category	Age at menarche (in years)					Total n= 83
	10	11	12	13	>13	
Very severely underweight	0	0	0	0	1	1
Severely underweight	0	1	0	0	1	2
Underweight	1	9	3	8	2	23
Normal	2	3	12	21	6	44
Overweight	2	4	2	2	1	11
Obesity grade 1	0	0	0	0	1	1
Obesity grade 2	0	0	1	0	0	1
Grand Total	5	17	18	31	12	83
Chi-square p-value	0.003*					
Inference	**Variables are associated - Significant**					

p>0.05 –Not significant; *p< 0.05 – Significant; p< 0.001 – Highly significant

Table 2 infers the eating practices followed by the adolescent girls during menstruation. Even though they knew about the importance of nutrition during menstruation, it was surprising to see that 55% of the girls skip meals during their menstrual cycle. The main reason cited for skipping meals was subjects did not like to eat and the food was not tasty.

Table 2: Eating practices during menstruation

Statements	Age (in years)				Total n = 83	
	12-15		15-18			
Skip meals during menstruation	**n**	**%**	**n**	**%**	**n**	**%**
Yes	24	29	22	27	**46**	**55**
No	25	30	12	14	**37**	**45**
Meal which is skipped during periods						
Breakfast	13	16	5	6	**18**	**22**
Lunch	10	12	16	19	**26**	**31**
Dinner	8	10	5	6	**13**	**16**
Reason for skipping meals						
Don’t like to eat	24	29	18	22	**42**	**51**
Food is not tasty	8	10	12	14	**20**	**24**
Eating food increases weight	5	6	2	2	**7**	**8**
Others	12	14	3	4	**15**	**18**

Around 48% (40) of the subjects did not have any cravings of food while 30% (25) craved for foods during their menstruation and 20% (17) of them were unsure if they craved for food or no.

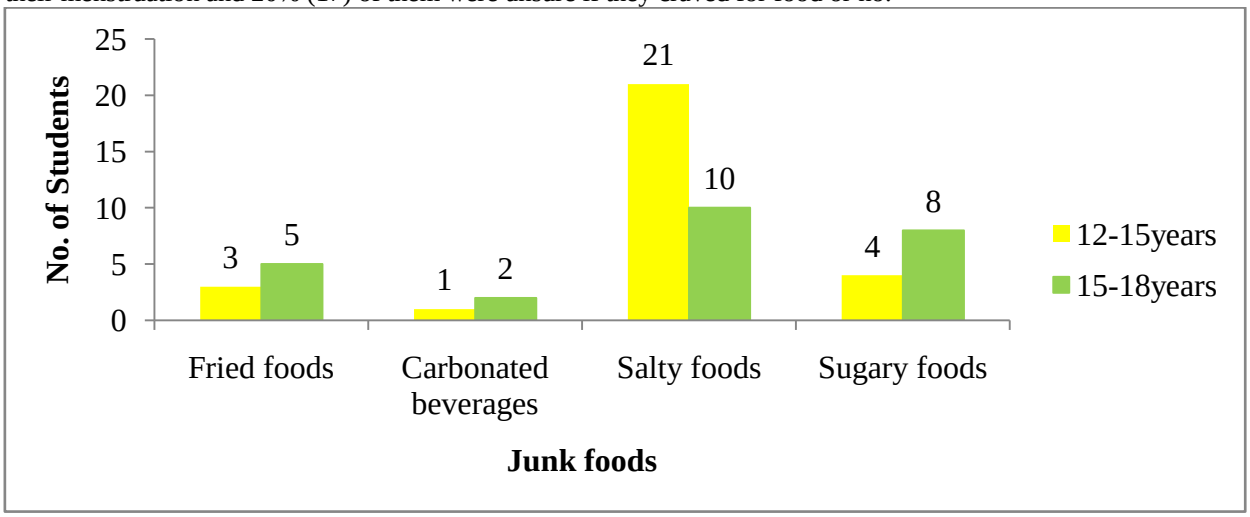

Fig 2: Junk foods consumed during menstruation

The above figure represents the type of junk foods consumed during menstrual cycles. It had come to light that majority of the subjects (54) consume junk foods. The most preferred junk food was salty foods (31) followed by sugary foods (12).
It was found that 65% (54) of the subjects consumed sugary foods like candies, cakes, chocolates, sweet biscuits etc. frequently and only 35% (29) consumed it rarely. Majority of them (70%) consumed salty foods regularly. It was surprising to note that cent percent of the girls aged 12-15 consumed it frequently. With respect to fruit and vegetable consumption, 77% (64) ate fruits rarely and interestingly, 93% of the study population ate vegetables frequently.

Poor nutritional status during adolescents is an important determinant of health outcomes. Short stature in adolescents resulting from chronic under nutrition is associated with reduced lean mass and deficiencies in muscular strength and working capacity. Overweight during adolescents has been associated with obesity related diseases during adulthood and can also effect the reproduction [2].
The anthropometric measurements have been sensitive indicators of health, growth and development during the individual's childhood. This plays a key role during their adolescent in relation to their nutritional status [3].
Nevein (2015) steered a survey on the prevalence of menstrual disorders among 400 adolescent girls in Saudi Arabia. This study indicated that the incidence of dysmenorrhea was the highest with a total of 368 samples out of the 400 subjects surveyed, followed by the prevalence of pre-menstrual symptoms, passage of clots , irregular cycles and the least prevalent was the abnormal duration of flow [4].
In a study conducted in different medical and paramedical Universities, dysmenorrhea and associated menstrual disorders were reported by 62% of the students. 15% of the subjects stated that menstrual pain caused them to absent from school and other activities. 87% of the subjects mentioned that menstruation affects the normal routine of their daily life [5].
A descriptive survey was conducted to determine the prevalence of dysmenorrhea and associated symptoms among the adolescent girls in certain residential schools in Udupi district. The sample size entailed of 223 adolescent girls aged between 12 and 17 years from 4 different schools. The tool to determine intensity of pain was a line with equidistant from 0 to 10 where the 0 showcased minimum dysmenorrhea and 10 was the maximum score. In this study, the prevalence of dysmenorrhea in the girls was associated with their family history of dysmenorrhea. More than 60% of the adolescent girls experienced dysmenorrhea, moreover, out of the 233 samples, 12% had experienced mild pain, 33% had moderate pain and 17.6% of the girls had severe pain during menstruation. The common symptoms noticed during dysmenorrhea were tiredness, back pain and irritability whereas diarrhea, nausea, and vomiting were the least common symptoms concomitant with dysmenorrhea. It was reported that 68 girls were experiencing dysmenorrhea right from their first menstruation or menarche onwards and close to 50% of the girls experienced painful menstruation for 1-4 hours. Almost close to 45% of the girls experience pain which affects their daily activities and sleep [6].
Poor dietary practices for losing weight, has been related to dysmenorrhea. Adolescent girls who are overweight and having been consuming junk food have premenstrual symptoms. Pre-menstrual symptoms

were also commonly seen in girls eating less and were not doing regular exercise. It has been observed that girls who have been dieting had significant heavy bleeding, dysmenorrhea and also pre-menstrual symptoms. Unintentional weight loss has been associated with irregular menstruations and dysmenorrhea. Lack of regular physical activity has significant effect on pre-menstrual symptoms [7].

A qualitative cross- sectional investigation was done by [8], on the common menstrual problems prevalent among the school going adolescents girls aged between 11 and 15years in Pune. In the study, it was noted that there was a statistical association existed between the nutritional status of adolescent girls based on the BMI and dysmenorrhea, oligomenorrhea and pre-menstrual syndrome. Poor nutritional status has been often linked with the common menstrual problems among adolescent girls.

The age at menarche has been prolonged in underweight subjects and age at menarche for over-weight and obese subjects were found to earlier. The menses and menstrual cycle length had significantly prolonged in the overweight and obese individuals [9].

4. Conclusion

Out of the 83 girls screened, it was observed that the BMI affected the onset of menarche i.e. higher the BMI earlier was the menarche and lower the BMI, later was the menarche. Majority (59) of subjects experienced pre-menstrual symptoms and the most common symptoms experienced were back pain (36) and body pain (31). Dysmenorrhea was experienced by most of the girls in the study population. Poor eating habits during menstruation have been a significant cause for menstrual disorders among adolescent girls. Hence proper knowledge on nutrition and its effect on menstruation should be imparted to adolescent girls to improve their quality of life.

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