

## Pattern of menstrual morbidities and the associated socio-demographic factors among adolescent girls in a rural area of Nagpur

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### Abstract

India is home to 243 million adolescents, nearly one fifth of its total population. Females constitute an important proportion of the population; therefore their health needs are of equal importance. One of the major issues regarding the menstrual morbidities is that it has been neglected since long, in spite of it involving a good proportion of adolescent girls. A community based cross sectional study was carried out in the field practice area of rural health centre under the administrative control of department of Community Medicine of a tertiary care hospital. The sampling technique used was systematic random sampling. A pre-designed and pre- tested questionnaire including both open and close ended questions was used. The girls were asked for their age, religion, education and type of family, age at menarche, rhythm, frequency, and duration of the menstrual cycle. Out of the total 600 adolescent girls, 270 adolescent girls suffered from at least one of the menstrual morbidities giving a prevalence of 45%. The various morbidities were found to be as; dysmenorrhoea 126 (21%), oligomenorrhoea in 78 (13%), menorrhagia in 42 (7%), polymenorrhoea in 18 (3%) and hypomenorrhoea in 96 (16 %) of the girls respectively. The association of age of the girl, education of the girl, education of mother, with menstrual morbidity was found to be statistically significant.

**Keywords:** Adolescent girls, Menstrual morbidities, Socio-demographic factors.

### Introduction

The term adolescence has been derived from the Latin word 'adolescere', which means to grow into maturity.<sup>(1)</sup> The World Health Organization defines adolescent age group as the age between 10-19 years, to accommodate the different phases of development in the second decade of life, adolescent age group is divided into early (10–13 years), middle (14–16 years) and late (17–19 years) adolescence.<sup>(2)</sup> According to 2011 census, India is home to 243 million adolescents, nearly one fifth of its total population.<sup>(3)</sup> Females constitute an important proportion of the population; therefore their health needs are of equal importance. Physical, endocrinological, genital, psychological and emotional changes occurring during puberty are modulated by the interaction of various hormones secreted through hypothalamus-pituitary-ovarian axis as well as thyroid and adrenal glands.<sup>(4)</sup>

In developed countries, good nutrition induces puberty at an earlier age. Stress, vigorous exercise and lack of nutritious diet can delay the pubertal process. Although menstruation is the last stage of puberty, it holds immense importance in a girl's life. Menstruation is the end point of series of events which begins in the cerebral cortex and hypothalamus and ends in the hypothalamic-pituitary-ovarian-uterine axis, and any break in this axis creates menstrual problems. Although menstrual disorders are a common problem during adolescence, these disorders cause significant anxiety for adolescents and their families. The menstrual morbidities play an important role in adolescent girls' life as they affect their day-to-day life by interfering with their normal activities. The prevalence of menstrual

morbidities across the world ranges from 25%<sup>(5)</sup> to 73%<sup>(6)</sup> according to different studies published across the country and globe. The prevalence and proportion of various types of menstrual disorders differ in different adolescent population, suggesting socio-cultural and regional variation.

One of the major issues regarding the menstrual morbidities is that it has been neglected since long, in spite of it involving a good proportion of adolescent girls. In this region, there are very few studies on prevalence of menstrual morbidities. In an effort to obtain community based data, this study was conducted in a rural area catered to by the rural health training centre, (attached to a tertiary care hospital) with the objective of estimating the prevalence of menstrual morbidities and studying the various factors associated with it.

### Materials and Method

A community based cross sectional study was carried out in the field practice area of rural health centre under the administrative control of department of Community Medicine of a tertiary care hospital in Nagpur from December 2013 to June 2015. Study population consisted of all the adolescent girls of 10-19 years of age group residing in the area fulfilling inclusion and exclusion criteria. Considering the prevalence of menstrual morbidities as 42% from previous study and relative precision of 10% at 95% confidence level, the sample size was calculated as 560 which was rounded off to 600.<sup>(7)</sup> The formula used for sample size calculation is, Sample Size (n) =  $Z (1-\alpha/2)^2 p q / I^2$ ; where,  $Z (1-\alpha/2) = 1.96$ ; p = prevalence; q = 1 - p prevalence I =

10% of P. The sample size of 552 was calculated which was rounded off to 600. Total adolescent population of the study area was 13345, consisting of 6424 girls. Out of 6424 girls, sample size of 600 was selected by Systematic Random Sampling technique. The sampling interval was 11, which was obtained by formula:

Total Eligible Population/Sample Size =  $6424/600 = 10.70 = 11$  ( $K^{\text{th}}$  value)

A list of all the adolescent girls fulfilling inclusion criteria was prepared. First girl was selected between 1 to 11 numbers by lottery method and then every 11<sup>th</sup> girl was considered for study, till the required sample size was achieved. A pre-designed and pre-tested questionnaire including both open and close ended questions was used. The girls were asked for their age, religion, education and type of family, age at menarche, rhythm, frequency, and duration of the menstrual cycle. The dependent variables were:

1. Menstrual morbidity: Girls having any one of the morbidities mentioned below were taken as presence of menstrual morbidity.
  - a) Dysmenorrhoea: Can be defined as painful menstruation of sufficient magnitude so as to incapacitate day-to-day activities.<sup>(8)</sup> The girls were asked about presence of pain during menstruation, area of pain, severity of pain whether it was severe enough to incapacitate a day's work.
  - b) Oligomenorrhoea: Denotes infrequent, irregularly, timed episodes of bleeding usually occurring at intervals of more than 35 days<sup>(4)</sup>. The girls were asked whether the rhythm was more than 35 days.
  - c) Polymenorrhoea: Denotes frequent episodes of menstruation, usually occurring at intervals of 21 days or less. The girls were asked for whether the bleeding episode was occurring less than 21 days.<sup>(4)</sup>
  - d) Menorrhagia: The girls who were having heavy episodes of bleeding (self reported) and/or the duration of flow was more than 7 days.<sup>(4)</sup>
  - e) Hypomenorrhoea: The girls were asked for regular menstrual cycle with blood flow very less in amount, or duration of flow for two days or less.<sup>(4)</sup>
2. Normal menstrual cycle: Cyclic menstrual cycle with an average rhythm of  $28 \pm 7$  days, inclusive of 4-6 days of bleeding and estimated blood loss is between 50 and 200 ml.<sup>(4)</sup>

3. Regular menstrual cycle: a regular cycle of 28 days rhythm with a deviation of 7 days was considered regular.<sup>(4)</sup>

4. Irregular Menstrual cycle: Any deviation from the above was considered as irregular menstrual cycle.

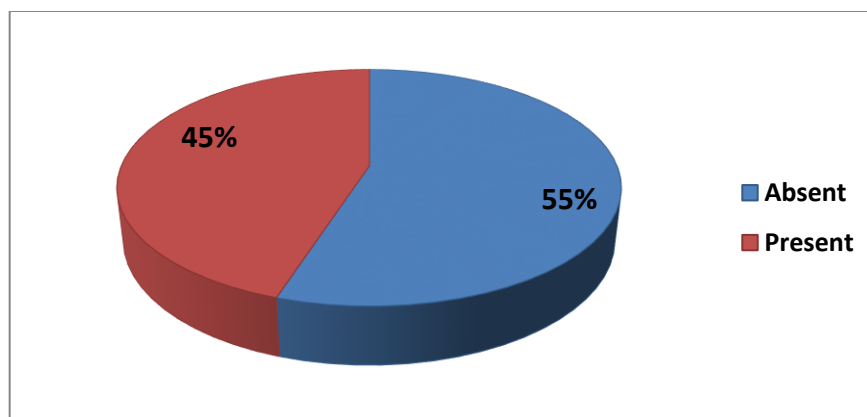
The independent variables were various socio-demographic factors like girl's education, mother's education, socioeconomic status of the study participant. Per capita monthly income was calculated and used for assessing the socioeconomic status using Modified B. G. Prasad classification. Weight and height of all the study subjects was measured and the anthropometric measurements were recorded. Study subjects were measured for their weight, to the nearest 0.5 kg, using a bathroom scale without wearing footwear and minimum clothes. Measurements were plotted on the wall using a non-elastic measuring tape for recording the height of the girls and proper posture was ensured at the time of height measurement. Height measurements were recorded to the nearest 0.5cm. BMI was calculated by the following formula:  $\text{BMI} = \text{weight (in Kg)} / \{\text{height (in metre)}\}^2$ . BMI was classified according to the WHO 2007 growth standards using Z scores of BMI for age for girls between 5 to 19 years of age.<sup>(9)</sup>

Data was analysed using Epi-Info Software (version 7.1.1.14) and Open-Epi software (version 3.03). Categorical variables were expressed in percentage. Pearson's Chi square was used for hypothesis testing. Odd's ratios along with 95% confidence limits were calculated to study the association between independent and dependent variables. P value  $\leq 0.05$  was considered as being statistically significant and P value  $< 0.001$  was considered as highly significant.

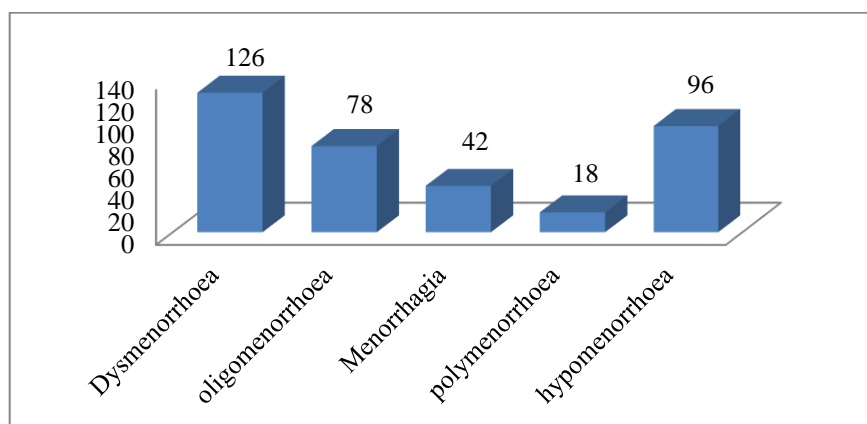
**Ethics:** The ethical clearance was taken from Institutional Ethical committee and concerned authority of the Gram Panchayat in rural field practice area.

## Results

In this study, out of 600 adolescent girls, 270 girls had at least one type of menstrual morbidity hence prevalence of menstrual morbidities was found to be 45%. The various morbidities were found to be as; dysmenorrhoea in 126 (21%), oligomenorrhoea in 78 (13%), menorrhagia in 42 (7%), polymenorrhoea in 18 (3%) and hypomenorrhoea in 96 (16%) of the girls respectively (Fig. 1 and 2).



**Fig. 1: Prevalence of menstrual morbidity among adolescent girls (N=600)**



**Fig. 2: Pattern of menstrual morbidities among study participants (N=600)**

\*Some of the participants were having more than one morbidity so total morbidities is greater than the number of study participants

More than half (55.8%) of the adolescent girls who had menstrual morbidity were in the late adolescent age group. The association of age group with menstrual morbidities was found to be highly significant ( $P$ -value: 0.001). The association of age of the girl and anemia with menstrual morbidity was found to be statistically significant (Table 1 and 2).

**Table 1: Socio-demographic factors related to menstrual morbidities among adolescent girls (N=600)**

Factors	Morbidity present	Total	Odds Ratio	95% Confidence Interval	P-value
<b>1) Age group</b>					
Late adolescence (17-19 years)	144	258	1.00	---	0.001
Early and Middle adolescence (10-13 & 14-16 years)	126	342	2.17	1.557-3.011	
<b>2) Anemic status</b>					
Anemia	226	480	1.00	---	0.04
No anemia	44	120	1.54	1.018-2.321	
<b>3) Age at menarche</b>					
≤13 years	156	354	1.00	---	0.58
≥13 years	114	246	0.91	0.658-1.265	

$P$  value  $\leq 0.05$  is statistically significant and  $P$  value  $< 0.001$  is highly significant.

Age at menarche was not found to be associated with menstrual morbidities. The trend of menstrual morbidities was further explored and it was found that education of the girls was associated significantly with menstrual morbidities. Increase in education level had higher predilection for menstrual morbidity as the girls were more aware regarding the symptoms so they could identify with the problem and state it. It was also seen that the mothers who were better educated showed more chances of having menstrual morbidity as compared to illiterate ones. There was highly significant association seen between menstrual morbidity and educational status of the mother.

**Table 2: Association of menstrual morbidities with socio-demographic factors among adolescent girls (N=600)**

Socio-demographic factors	Menstrual morbidity present	Total	Odds Ratio	Chi-Square for linear trend	p-value
1) Education of girls					
Primary School	12	48	1.00	6.132	0.01
Middle School	102	228	2.43		
High School	156	324	2.79		
2) Socioeconomic Status					
Class V	08	24	1.00	1.359	0.24
Class IV	49	120	1.38		
Class III	128	270	1.80		
Class II	73	162	1.64		
Class I	12	24	2.00		
3) Education of the mother					
Illiterate	18	54	1.00	7.207	0.007
Primary School	30	78	1.25		
Middle School	36	114	0.92		
High School	144	252	2.66		
Intermediate	24	66	1.14		
Graduate	18	36	2.00		
4) Nutritional Status of girls(BMI)					
Normal (<+1SD to >-2SD)	180	419	1.00	0.786	0.38
Overweight (>+1SD)	07	16	1.03		
Thin (<-2SD)	61	115	1.50		
Severely Thin (<-3SD)	22	50	1.04		

P value  $\leq 0.05$  is statistically significant and P value  $< 0.001$  is highly significant.

## Discussion

The Government of India has made the adolescent health as a part of RCH package since 1997. The adolescent component has recently been added in the year 2005 which embraces the menstrual hygiene, menstrual morbidity, RTI as an important component of the RMNCH+A strategy.

In the present study the prevalence of menstrual morbidities was 45%. According to literature, prevalence rate of menstrual morbidities varies from 25%<sup>(5)</sup> to 73%<sup>(6)</sup> across different regions and communities within India and abroad.

Abraham A et al in a study of gynaecological morbidities found the prevalence of menstrual morbidities to be 36.85%,<sup>(10)</sup> while Rehman MM et al in a similar study in Dhaka reported that 63.9% of the adolescent girls were suffering from some type of menstrual disorders.<sup>(11)</sup> Kulkarni M V et al found that in an urban slum of Nagpur, 65.18% girls were having one or more reproductive morbidity.<sup>(12)</sup> Sharanya T found prevalence of menstrual morbidity to be 73% in slum dwelling girls in Chennai.<sup>(6)</sup> This difference in prevalence of morbidities could be due to geographical differences, biological variations, socioeconomic variations, and also due to some cultural differences.

The socio-demographic factors taken into consideration here were age of the adolescent girls, education of the girls, and presence of anaemia, socioeconomic status of the girls, BMI range and age of

menarche of the girls. In the present study more than half (55.8%), of the adolescent girls who had menstrual morbidity were in the late adolescent age group while less than half (36.8%) of them belonged to early & middle adolescent age group. The association of age group with menstrual morbidities was found to be highly significant (P-value: 0.001). It was seen that the odds of having menstrual morbidities among late adolescent girls is 2.2 times more as compared to girls in the early & middle adolescent group. Rehman M M et al found that older adolescents (15-19 years) reported 1.8 times more gynaecological morbidity than younger adolescents (10-14). There was highly significant association found between age and reproductive morbidity (P-value $< 0.0001$ ).<sup>(11)</sup>

Low level of blood haemoglobin concentration is often associated with irregularities of menstrual problems. The association of anaemic girls with menstrual morbidity was found to be statistically significant (P-value: 0.04). The odds of girls having menstrual morbidity among those who are anaemic was 1.5 as compared to those who were non-anaemic. Mohite R V et al in a similar study showed that 57.9% girls were anaemic and there was significant association between anaemia and menstrual problems.<sup>(13)</sup>

In the present study, the association of age at menarche with menstrual morbidities was not found to be statistically significant. Balasubramanian P found that the prevalence of menstrual morbidity increased with

age at menarche.<sup>(14)</sup> Abraham A et al mentioned that the study participants having age at menarche more than 13 years was a significant risk factor for menstrual diseases.<sup>(10)</sup> The variation present may be due to biological differences of the study participants.

Education can be an important tool to assess problems prevailing in the community. The association between education of adolescent girls and menstrual morbidities was found to be statistically significant (P-value: 0.01) in the present study. Linear trend was seen. There is a direct relation between increase in levels of education and increase in the number of morbidities. Kulkarni M V et al and Abraham A et al found that a highly significant statistical association was present between level of education of girl and reproductive morbidity.<sup>(12,10)</sup>

Socioeconomic status is one of the determinants in the occurrence of morbidities. Many factors like hygiene practices, type of pad used, type of diet consumed are related to the socioeconomic status of the individual in some way or the other. The prevalence of menstrual morbidities was 44.7% in Class III, IV, V together whereas in Class I, II it was found to be 45.7%. The association was not found to be significant, though the prevalence was seen to be more in the higher socioeconomic group. This may be attributed to malnutrition or other practices prevalent in the community. Rehman M M et al found that with the increase in socioeconomic status there was an increase in the presence of morbidities, this may be due to increased power of autonomy and hence more self reporting of the morbidities by the adolescents.<sup>(11)</sup> Whereas Kulkarni M V et al, Abraham A et al, Mohite R V et al did not find any association between socioeconomic status of the family and menstrual morbidities in the adolescent girls.<sup>(12,10,14)</sup>

The association between mother's education and menstrual morbidity was found to be statistically significant (P-value: 0.007) in this study. Sanyal S et al found socioeconomic variables such as the educational levels of the parents had a significant relationship with some of the menstrual outcomes.<sup>(15)</sup>

BMI is an indicator of nutritional status in children and adolescents. Although the association of BMI of adolescent girls with menstrual morbidities was not found to be statistically significant in the present study, it was found that deviation from the normal status showed more chances of having menstrual morbidity. Lakkawar et al found that increase in BMI was significantly associated with oligomenorrhoea however no relationship was established with dysmenorrhoea.<sup>(16)</sup>

## Conclusion

Out of the total 600 adolescent girls, 270 adolescent girls suffered from at least one of the menstrual morbidities giving a prevalence of 45%. The different types of morbidities which were explored in the study were dysmenorrhoea, oligomenorrhoea, menorrhagia,

polymenorrhoea and hypomenorrhoea with their individual prevalence being 21%, 13%, 7%, 3% and 16% respectively. The prevalence of anaemia was found to be 80%. The correlates of menstrual morbidities which were found to be associated with it were age of the adolescent girls, education of the girls, education of mother and anaemia.

Although menstrual morbidity is high among adolescent girls, most of them are not aware about the problem. It is recommended that proper education sessions (regarding information on various types of morbidities) be conducted at individual, family & community level from time to time.

In adolescent girls haemoglobin levels are below normal and menstruation further adds to their problem. Emphasis should be given on proper nutrition and diet. The girls should be educated and trained to identify and utilise low cost iron rich foods found around them to fight against anaemia.

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