P-ISSN: 2618-0723
E-ISSN: 2618-0731

NAAS Rating: 5.04
www.extensionjournal.com

International Journal of Agriculture Extension and Social Development

Volume 7; SP-Issue 9; September 2024; Page No. 38-43

Received: 05-07-2024
Accepted: 13-08-2024

Indexed Journal
Peer Reviewed Journal

Menstrual distress and school absenteeism among adolescents in Hisar, Haryana

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DOI: https://doi.org/10.33545/26180723.2024.v7.i9Sa.1050

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Abstract

Menstrual distress may play a major role in the academic performance of adolescent female students. Menstruation related symptoms may have negative influences on academic learning outcomes. Poor menstrual hygiene management has been shown to result in a sense of shame, anxiety, and embarrassment that contributes to absenteeism and poor performance at school. The objectives of this study were to determine the percentage of girls absent from school during menstruation, to evaluate the menstrual distress associated with school absenteeism during menstruation. The study was conducted on 240 adolescent girls in the age group of 10-14years and 15-19 years belonging to rural and urban areas of Hisar district. The study found that early menarche respondents who attained menarche early were more distressed as compared to medium and delayed menarche respondents. Menstrual distress was observed more in respondents with irregular cycle pattern than the respondents having regular cycle pattern. 57.1% respondents were absent from the school during their menstruation, where as 72.3% respondents missed 1-2 days per month during periods whereas 27.7% were absent 3-4 days per month on account of periods. As per academic achievement of adolescents in context of menstrual distress 25.8% respondents had poor performance followed by 51.6% respondents who had average rest of the 22.5% had excellent academic achievement.

Keywords: Menstrual distress, adolescent girls, academic achievement, menstruation, school absenteeism

Introduction

Menstruation is a common and normal experience during the reproductive age of the girl child. It is a natural process that occurs monthly in healthy adolescent or teen age girls. The first menstruation occurs between 11 and 15 years with a mean of 13 years (Hertweck and Yoost, 2010) [15]. It takes place during adolescent period in which dominant physiological and emotional changes take place. It is an essential period where females are preparing and adjusting themselves to manage their menstrual bleeding in safe and clean way (Deliwala *et al.* 2013) [16]. Once this cycle is disturbed regular menstrual cycle ceases for some period, the nature and length of cessation depends upon initiation of the stressful event (Allsworth, 2007) [14]. Due to menstrual distress, there is interference in everyday activities in adolescent girls. Dysmenorrhea is one of the major contributors to back pain, headache, fatigue, and affects taking part in sports, socialization, and attentiveness in home and school or college work. There is a negative correlation between menstrual distresses with menstrual attitude. Menstrual attitude is closely correlated with the feeling of bearing menstrual distress. Attitude may be positive or negative, but by specific understanding we acknowledged the adolescent girls to improve menstrual attitude (Reed and Carr, 2018) [13]. Many adolescent girls during their menstrual cycle experienced various kind of stress that's increasing with age. Dysmenorrhea is one of the most prevailing problems in young females. About 10% of females due to painful periods disturb their job approximately 1 days-3 days.

Stress is one of the major manifestations for too much bleeding, have a painful period, too frequently, and miss periods. While in distress someone feels extreme anxiety that leads toward depression and excessive behavioral disorder women can be acquaintances with more stress as compared to men and describes more somatic symptoms disorder (Ecochard R and Gougeon A., 2000) [17]. Age at menarche may vary, but the majority of girls are still in school, resulting in inevitable consequences for their education. The menstrual period has a notable role on the academic performance of students (Boyle, 1997) [19]. Therefore if menstruation is a barrier to education, it is an issue that must be addressed. The academic performance of girls varies during their menstrual cycle, in a way that the mental status is decreased during and several days before the period. However, some research on the performance of well academically qualified women has shown that they were less likely to be negatively affected by menses (Jahromi, *et al*., 2008) [20]. Several studies documented that menstruation related problems, had affected more than a third of student's class concentration, participation, socializing with friends, test taking skills and homework task performance. Dysmenorrhea was significantly associated with school absenteeism and decreased academic

performance, sports participation, and socialization with peers (Neamat *et al.*, 2011) [21].

The purpose of the present study is to determine menstrual distress among school students. Because, in past, there are few types of research (evidence) in our country, that evaluate menstrual distress among adolescents. Many health problems are caused to menstrual distress that can affect daily activities of living such as work at home, job timings or work time, and overall academic performance of the females (Yang NY and Kim SD.2016) [18]. The findings of the study carry out the significant implications for health professional, policy makers, psychologists and researchers. Some intervention programmes may also be developed for overcoming menstrual distress and providing positive support for adolescent girls.

Objectives

1. To study the impact of menstrual distress on academic achievement of adolescent girls.
2. To find prevalence of school absenteeism during menstruation.

Methodology

The study was conducted purposively in Hisar district of Haryana state as the study required frequent visits to each selected school for data collection. One district was selected randomly. From selected district, to draw rural sample two villages was selected randomly and from selected villages two schools was randomly selected. For urban sample similar procedure was adopted to draw the sample from schools located in city area. From the selected schools of rural locations, total of 120 adolescent girls which comprise 60 early adolescents and 60 late adolescents were selected randomly. Similar procedure was adopted for selection of urban sample. Hence, a total of 240 adolescent girls (120 rural and 120 urban) constituted the sample for the study. Self- developed questionnaire was used to obtain information on personal and socio-economic variables. Comprehensive Menstrual Distress scale was used to measure the menstrual distress of the respondents. And academic performance measured by self–developed interview schedule.

Statistical analysis

To draw the inferences as per different objectives data analyzed using appropriate statistical tests–frequency and percentage, mean, Standard Deviation. Chi-square test, z test and Anova.

Results

Socio-economic profile of rural and urban adolescent girls: Data in Table 1 portrayed socio-economic profile of rural and urban adolescent girls. As per distribution of respondents on the basis of caste variable results depict that 40.8% respondents were from general caste, 33.4% were from schedule caste and 25.8% respondents were from backward caste category. Out of total sample, 58.3% respondents had nuclear families and only 41.7% had joint family system. With regard to size of the family is concerned results, revealed that 46.7percent respondents had small sized families followed by 43.3% having to medium and 10% had large sized families. With regards to mother education40.8% mothers were educated up to matric or 10+2 level, followed by 28.8% of mothers who were illiterate and rest educated up to middle level 16.2%. In the 14.2% respondent mothers were graduate/post graduate. The data with regard to mother occupation total sample data showed that majority of 68.7% mothers were homemakers followed by 11.7% working as labourers and 19.6% were engaged in service sector. As far as father education is concerned results pinpointed that 65.4% fathers were educated up to matric /10+2 level, followed by 16.3% father who were graduate/post graduate level, and rest of 12.9% respondent father who were educated up to middle only 5.4percent fathers were illiterate in the total sample. Further results indicated that, maximum percentage i.e. 48.4% were engaged in service sector followed by 25% in farming activities and rest were engaged in business (15.8%) and labour work (10.8%).

Table 1: Socio-economic profile of rural and urban adolescent girls

Sr. No.	Area Socio-economic	Rural (n=120) f (%)	Urban (n=120) f (%)	Total (n=240) f (%)
1.	**Caste**			
	SC	57 (47.5)	23 (19.2)	80 (33.4)
	BC	34 (28.3)	28 (23.3)	62 (25.8)
	General	29 (24.2)	69 (57.5)	98 (40.8)
2.	**Family type**			
	Nuclear	72 (60.0)	68 (56.7)	140 (58.3)
	Joint	48 (40.0)	52 (43.3)	100 (41.7)
3.	**Size of family**			
	Small(<5 members)	66 (55.0)	46 (38.4)	112 (46.7)
	Medium(5-10 members)	49 (40.8)	55 (45.8)	104 (43.3)
	Large (>10 members)	05 (4.2)	19 (15.8)	24 (10.0)
4.	**Mother education**			
	Illiterate	48 (40.0)	21 (17.5)	69 (28.8)
	Up to middle	28 (23.4)	11 (9.2)	39 (16.2)
	Matric / 10+2	31 (25.8)	67 (55.8)	98 (40.8)
	Graduate/Post graduate	13 (10.8)	21 (17.5)	34 (14.2)
5.	**Mother occupation**			
	Homemaker	85 (70.8)	80 (66.7)	165 (68.7)
	Labour	23 (19.2)	05 (4.1)	28 (11.7)
	Service	12 (10)	35 (29.2)	47 (19.6)

6.	**Father education**			
	Illiterate	08 (6.7)	05 (4.2)	13 (5.4)
	Up to middle	19 (15.8)	12 (10)	31 (12.9)
	Matric / 10+2	79 (65.8)	78 (65)	157 (65.4)
	Graduate/Post graduate	14 (11.7)	25 (20.8)	39(16.3)
7.	**Father occupation**			
	Labour	18 (15.0)	08 (6.7)	26 (10.8)
	Farming	52 (43.3)	08 (6.7)	60 (25.0)
	Business	12 (10.0)	26 (21.6)	38 (15.8)
	Service	38 (31.7)	78 (65.0)	116 (48.4)

Note: Figures in parentheses indicate percentages. BC (backward class), SC (scheduled caste)

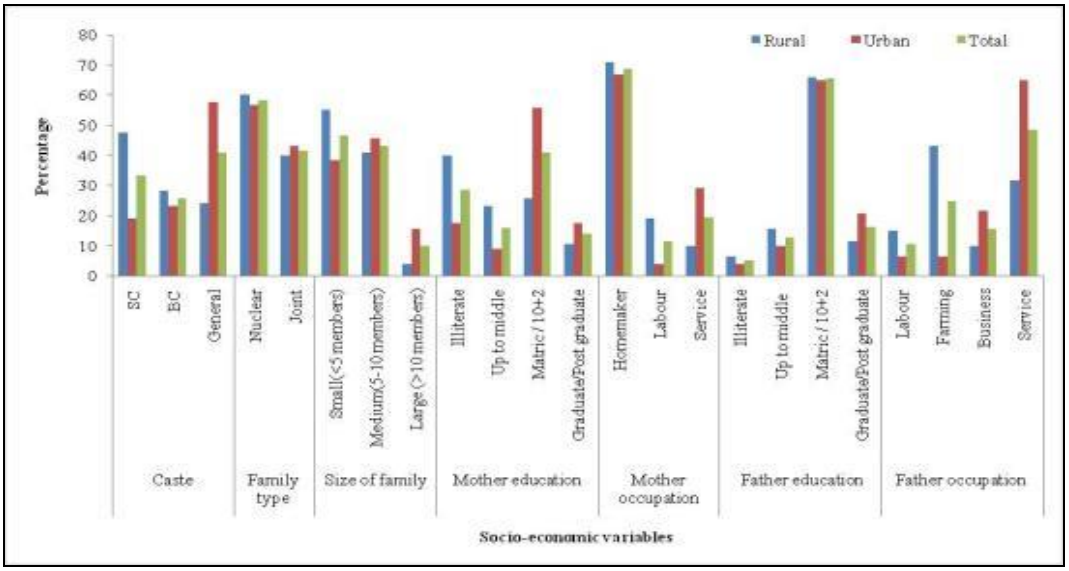

Fig 1: Socio-economic profile of rural and urban adolescent girls

Distribution of adolescents on school attendance

Data presented in table 2 revealed that out of total sample 57.1% adolescent girls reported school absenteeism during menstruation. Further regarding number of days of 48 absenteeism per month, 72.3% respondents missed 1-2 days per month, and 27.7% missed school for 3-4 days per month. Out of the total sample 42.9 percent found to have regular attendance during periods. When analyzing the reasons behind the absenteeism of respondents it was found that maximum respondents (38.7%) missed school because of pain occurs during menstruation and (21.2%) missed school due to discomfort from bloating or tiredness. Data portrayed in same table further reflected that 14.6% were absent due to afraid of staining clothes, 1.3% respondents were afraid of others making fun, 2.2 per-cent reported lack of disposal system for sanitary product as a reason of school absenteeism, 1.5% mentioned lack of private space for wash or change, 4.4% missed school due to unclean latrines, 6.6%reported no access of pads, 1.5% were absent because of religious or cultural restrictions and lastly 8%mentioned that they were absent due to depressed or irritable mood during periods.

Table 2: Distribution of adolescents on school attendance

Sr. No	Area School attendance		Rural (n=120) f (%)	Urban (n=120) f (%)	Total (n=240) f (%)
1.	School attendance during menstruation	Yes	76 (63.3)	61 (50.8)	137 (57.1)
		No	44 (36.7)	59 (49.2)	103 (42.9)
2.	Number of days of absence per month	1-2	61 (80.3)	38 (62.3)	99 (72.3)
		3-4	15 (19.7)	23 (37.7)	38 (27.7)
3.	**Reasons of absenteeism**				
i)	Afraid of staining clothes		9 (11.8)	11 (18.0)	20 (14.6)
ii)	Afraid of others making fun		0 (0.0)	2 (3.3)	2 (1.3)
iii)	Pain		35 (46.1)	18 (29.5)	53 (38.7)
iv)	Discomfort from bloating or tiredness		16 (21.1)	13 (21.3)	29 (21.2)
v)	Lack of disposal system for sanitary product		0 (0.0)	3(4.9)	3(2.2)
vi)	Lack of private space wash or change		0 (0.0)	2 (3.3)	2(1.5)
vii)	Unclean latrines		4 (5.3)	2(3.3)	6 (4.4)
viii)	No access to pads		3 (3.9)	6 (9.8)	9 (6.6)
ix)	Religious or cultural restrictions		0 (0.0)	2(3.3)	2 (1.5)
x)	Too depressed or irritable		9 (11.8)	2(3.3)	11(8.0)

Note: Figures in parentheses indicate percentage

Mean difference in menstrual distress on the basis of menstrual profile

Comparison of menstrual distress mean scores against menstrual profile of adolescent girls depicted statistically significant difference in psychological distress (F=6.95*) at 0.05 level of significance. Mean score reveals that early adolescents who attained menarche early (M=25.89) had more psychological distress than the medium menarche (M=23.51) and delayed menarche (M=25.11) adolescent girls. Statistically significant difference was observed in mean scores of positivity on womanhood distress (F=5.08*) at 0.05 level of significance. Mean score depicted that early menarche adolescents (M=27.36) had more positivity on womanhood distress than the medium menarche (M=25.38) and delayed menarche (M=26.10) adolescent girls.

Similarly Statistically significant difference was observed in overall menstrual distress mean scores (F=7.35*) at 0.05 level of significance. Mean score revealed that early menarche adolescents (M=111.64) had more overall menstrual distress than the medium menarche (M=108.75) and delayed menarche (M=109.11) adolescent girls.

Statistically non-significant differences were observed with rest of menstrual distress aspects which includes physical distress, socially imposed impurity and restriction against the menstrual profile of adolescent girls.

Table 3: Mean difference in menstrual distress on the basis of menstrual profile (N=240)

Sr. No.	Menstrual profile Menstrual distress	Early menarche (10-12years)	Medium menarche (13-14 years)	Delayed menarche (15-17 years)	F value
		Mean±SD	Mean±SD	Mean±SD	
1.	Physical distress	46.71 ± 7.21	44.62 ± 7.68	45.01 ± 6.89	2.41
2.	Socially imposed impurity and restriction	23.41 ± 4.67	24.97 ± 5.02	24.20 ± 5.45	2.17
3.	Psychological distress	25.89[b] ± 5.32	23.51[a] ± 6.01	25.11[b] ± 5.29	6.95*
4.	Positivity on womanhood	27.36[b] ± 6.32	25.38[a] ± 5.92	26.10[a] ± 5.55	5.08*
5.	Overall menstrual distress	111.64[b] ± 18.01	108.75[a]±17.62	109.11[a]±17.02	7.35*

*Significant at 0.05 level

Mean difference in menstrual distress on the basis of menstrual cycle pattern

Statistically significant difference was observed in physical distress (Z=2.83*) at 0.05 level of significance. Mean score reveals that adolescents having irregular cycle pattern (M=47.01) had more physical distress than adolescents having regular cycle pattern (M=44.61).Statistically significant difference was observed in mean scores of psychological distress (Z=2.18*) at 0.05 level of significance. Mean score differences revealed that respondents with irregular cycle pattern (M=24.39) had more psychological distress than respondent having regular cycle pattern (M=22.84).

Statistically significant difference was observed in mean scores on positivity on womanhood distress (Z=3.66*) at 0.05 level of significance. Mean score difference revealed that adolescents having regular cycle pattern (M=27.56) had more positivity on womanhood distress than adolescents having irregular cycle pattern (M=24.99). Similarly statistically significant difference was observed in mean scores of overall menstrual distress (Z=2.20*) at 0.05 level of significance. Mean score confirmed that adolescents having that irregular cycle pattern (M= 113.08) had more overall menstrual distress than adolescents having regular cycle pattern (M=107.92). Statically non-significant differences were observed in socially imposed impurity and restriction against the menstrual cycle pattern.

Table 4: Mean difference in menstrual distress on the basis of menstrual cycle pattern (N=240)

Sr. No.	Menstrual cycle pattern Menstrual distress	Regular	Irregular	Z value
		Mean±SD	Mean±SD	
1.	Physical distress	44.61±6.11	47.01±6.98	2.83*
2.	Socially imposed impurity and restriction	24.64±5.31	24.06±5.77	0.81
3.	Psychological distress	22.84 ±5.61	24.39 ±5.41	2.18*
4.	Positivity on womanhood	27.56 ±5.23	24.99 ±5.63	3.66*
5.	Overall menstrual distress	107.92±15.46	113.08±20.46	2.20*

*Significant at 0.05 level

Distribution of adolescents on academic achievement

Table 5 pointed out data on distribution of adolescents on academic achievement. Table clearly envisages that 30.8%, 53.4%, 15.8% respondents of rural area had poor, average and excellent academic performance respectively, whereas, in urban area 20.8% had poor, 50%adolescents had average performance and 29.2%had excellent performance with regard to menstrual distress effects on academic achievement.

Table 5: Distribution of adolescents on academic achievement

Area Academic achievement		Rural (n=120) f (%)	Urban (n=120) f (%)	Total (n=240) f (%)
Academic achievement	Poor (33-50%)	37 (30.8)	25 (20.8)	62 (25.8)
	Average (51-70%)	64 (53.4)	60 (50)	124 (51.7)
	Excellent (71%)	19 (15.8)	35 (29.2)	54 (22.5)

Note: Figures in parentheses indicate percentage

Discussion

Regarding socio-economic variables majority of respondents belonged from nuclear and small sized families. As per distribution of respondents on the basis of caste results depicted that majority of respondents were from the general category. Data related to occupation of parents, it was highlighted that in rural area maximum number of fathers were engaged in farming, whereas, in urban area, majority of respondent's fathers were in service, which shows that in villages farming is the main source of income. Data related to mother's occupation revealed that maximum number of mothers in both rural and urban area were housewives. Results regarding the parental education revealed that majority of the respondent's fathers and mothers were educated up to matric/10+2 in both areas. Literate mothers, literate fathers, size of family, and living with parents were associated factors of good menstrual hygiene practice in this study group of girls having 1 to 4 family members have good menstrual hygiene practice; this might be due to more interaction and communication with mothers in small families (Bhusal, 2020) [12].

Further, results regarding the comparison of menstrual distress on the basis of menstrual profile revealed that early menarche respondents who attained menarche early were more distressed as compared to medium and delayed menarche respondents. Reason may be that majority of girls are unaware about menarche and menstrual bleeding before they experience it for the first time and are unprepared mentally and emotionally. Results of the present study are in the line of study carried out by (Bhattarai *et al*., 2018) [11]. The results of this study showed significant difference between different factors that were considered determinants of early menarche. Menstrual distress was observed more in respondents with irregular cycle pattern than the respondents having regular cycle pattern. Reason may be that irregular menstrual cycle pattern effect the health and presence of severe symptoms disturbed the adolescents psychologically, emotionally and socially. The results are in line with results of study carried out by (Kapoor and Khari, 2016) [10] which stated that majority (75%) girls had irregular periods and had menstrual flow for more than seven days, still none contacted a doctor which showed poor health care seeking behavior in them.

Data reflected that 57.1% respondents were absent from the school during their menstruation, where as 72.3% respondents missed 1-2 days per month during periods whereas 27.7% were absent 3-4 days per month on account of periods. The results further portrayed that main reason for school absenteeism reported by the respondents was pain experienced during periods. The present result confined with Vashisht *et al.*, (2018) [5] who stated that most of the girls did not come to school because of pain, excessive bleeding, fear of leakage, and out of embarrassment. Similar reasons were reported by Tegegne and Sisay, (2014) [8] that school absenteeism during menstruation days was also supported by the qualitative data as most students did not come to school because of the lack of sanitary materials, fear of sudden leakage of menstrual blood, and the mistreatment by the other students. Another study of (Bodat *et al*., 2013) [7] revealed that 30% girls admitted absenteeism from school during menses. This was due to the lack of privacy and non-availability of clean toilets and disposal facilities in the schools. In the study of (Garg *et al*., 2021) [6] the most common reason for missing school among girls was pain during menstruation and the girls having menstruation related problems were nearly twice more likely to miss school compared to those without such problems. (Vashisht *et al*., 2018) [5] illustrated that nearly 65% reported that menstruation affect the daily activities at school and that they had to miss their class tests and classes as a result of pain, anxiety, shame, anxiety about leakage, and staining of their uniform. Menstruation related problems like pain and increased bleeding also leads to school absenteeism (Lghoul *et al*. 2020) [4]. Moreover, Dambhare *et al*., (2012) [3] revealed that dysmenorrhea resulted in school absenteeism among 24% of school adolescent girls in study about age at menarche and menstrual cycle pattern among school adolescent Girls in Central India in district Wardha, India. According to Amu and Bamidele, (2014) [2] dysmenorrhea interfered with school girls‟ daily activities in Osogbo, South western, Nigeria.

As per academic achievement of adolescents in context of menstrual distress 25.8% respondents had poor performance followed by 51.6% respondents who had average rest of the 22.5% had excellent academic achievement. Results were consistent with finding of (Khamdan, 2014) [1] study among Gulf University medical students Manama, Kingdom of Bahrain reported that academic performance was affected by menstruation in several ways mainly study time 76%, concentration 65.8%, participation in group activities 58.1%, and examination performance 51.8% and class attendance 40.8%.

Conclusion

Menstrual distress can affect quality of life especially adolescent girls who miss their school, not be able to participate in classroom activities, struggle to carry out their usual daily activities, feel uncomfortable around people etc. Majority of girls are unaware about menarche and menstrual bleeding before they experience it for the first time and are unprepared mentally and emotionally. The results further portrayed that main reason for school absenteeism reported by the respondents was pain experienced during periods. Majority of the respondents had average academic achievement. So the study findings suggested the students need counselling or related facilities to reduce the effect of menstrual distress on academic performance. Further research also can be conducted to study the effect of menstruation on female adolescence students.

Acknowledgment
We are thankful to all the head teachers and teachers for their full cooperation during data collection process. Also acknowledge the students participated in this study.

Conflicts of interest: The authors have no conflicts of interest.

References

1. Khamdan HY, Aldallal KM, Almoosa EM, Alomani NJ, Halder ASM, Abbas ZI, Haji AAM, Aljamri SH, Hamadeh RR. The impact of menstrual periods on physical conditions, academic performance and habits of medical students. J Womens Health Care. 2014;3(5):1-4.
2. Amu EO, Bamidele JO. Prevalence of menstrual disorders among adolescent girls in Osogbo, South Western Nigeria. Int J Adolesc Med Health. 2014;26(1):101-106.
3. Dambhare DG, Wagh SV, Dudhe JY. Age at menarche and menstrual cycle pattern among school adolescent girls in Central India. Glob J Health Sci. 2012;4(1):105-11.
4. Lghoul S, Loukid M, Hilali MK. Prevalence and predictors of dysmenorrhea among a population of adolescent schoolgirls (Morocco). Saudi J Biol Sci. 2020;27(7):1737-42.
5. Vashisht A, Pathak R, Agarwalla R, Patavegar BN, Panda M. School absenteeism during menstruation amongst adolescent girls in Delhi, India. J Fam Community Med. 2018;25(3):163-8.
6. Garg S, Singh MMC, Marimuthu Y, Borle A, Bhatnagar N, Basu S. School absenteeism during menstruation among adolescent girls in resettlement colonies of Delhi: a community-based cross-sectional study. Indian J Community Health. 2021;33(1):82-9.
7. Bodat S, Ghate MM, Majumdar JR. School absenteeism during menstruation among rural adolescent girls in Pune. Natl J Community Med. 2013;4(2):212-6.
8. Tegegne TK, Sisay MM. Menstrual hygiene management and school absenteeism among female adolescent students in Northeast Ethiopia. BMC Public Health. 2014;14:1118.
9. Vashisht A, Pathak R, Agarwalla R, Patavegar BN, Panda M. School absenteeism during menstruation amongst adolescent girls in Delhi, India. J Fam Community Med. 2018;25(3):163-8. [Duplicate of reference 5]
10. Kapoor A, Khari S. Knowledge, attitude and socio-cultural beliefs of adolescent girls towards menstruation. J Nepal Pediatr Soc. 2016;36(1):42-9.
11. Bhattarai S, Subedi S, Acharya SR. Factors associated with early menarche among adolescent girls: A study from Nepal. J Community Med. 2018;4(1):102-8.
12. Bhusal CK. Practice of menstrual hygiene and associated factors among adolescent school girls in Dang District, Nepal. Adv Prev Med. 2020;2020:1292070.
13. Reed BG, Carr BR. The normal menstrual cycle and the control of ovulation. In: Endotext [Internet]. 1st ed. [cited 2024 Sep 5]. Available from: https://www.ncbi.nlm.nih.gov/books/NBK278984/
14. Allsworth JE, Clarke J, Peipert JF, Hebert MR, Cooper A, Boardman LA. The influence of stress on the menstrual cycle among newly incarcerated women. Women Health Issues. 2007;17:202-9.
15. Hertweck P, Yoost J. Common problems in pediatric and adolescent gynecology. Expert Rev Obstet Gynecol. 2010;5:311-9.
16. Deliwala KJ, Shah HH, Shah BS. Evaluation of menstrual problems among urban females of Ahmedabad. J Clin Res Lett. 2013;4:49-53.
17. Ecochard R, Gougeon A. Side of ovulation and cycle characteristics in normally fertile women. Hum Reprod. 2000;15:752-5.
18. Yang NY, Kim SD. Effects of a yoga program on menstrual cramps and menstrual distress in undergraduate students with primary dysmenorrhea: A single-blind, randomized controlled trial. J Altern Complement Med. 2016;22:732-8.
19. Boyle GJ. Effects of menstrual cycle moods and symptoms on academic performance: a study of senior secondary school students. Br J Educ Psychol. 1997;67:37-49.
20. Jahromi MK, Gaeini A, Rahimi Z. Influence of a physical fitness course on menstrual cycle characteristics. Gynecol Endocrinol. 2008;24(11):659-62.
21. Neamat A, Maher S, Nadia H, Eman R. Assessment of dysmenorrhea and menstrual hygiene practices among adolescent girls in some nursing schools at EL-Minia governorate, Egypt. J Am Sci. 2011;7(9):216-23.