



Proportion, Risk Factors and the Impact of Dysmenorrhea among Girls

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Abstract

Background: Dysmenorrhea is the leading cause of recurrent short-term school absence in adolescent girls and a common problem in women of reproductive age. There are many factors related to this disorder which include a younger age, low body mass index (BMI), smoking, early menarche, and prolonged menstrual flow. *Objectives:* (1) To find the proportion of dysmenorrhea among girls of a nursing college; (2) To find out the risk factors and impact of dysmenorrhea.

Materials and Methods: A cross-sectional study was conducted from November 2011 to April 2012 at Nursing College, VIMS, Bellary, Karnataka. Data were collected by a pre-tested and pre-designed semi-structured pro forma. The study was performed on a total of 196 students who agreed to participate and present at the time of study. Analysis was done by using Epi-info version 3.4.3.

Results: The average age of the study group was 19.3+1.8 years (range 17–30). Proportion of dysmenorrhea was found to be 77% and was significantly higher in females with positive family history of dysmenorrhea when compared to the others ($P < 0.05$), who had early age of menarche, irregular cycle, increased amount of flow, gynecological problems and lack exercise had high rate of dysmenorrhea compared to others but statistically it was not significant. In this study, because of dysmenorrhea 20.5% had class absenteeism, 23.2% college absenteeism, 44.4% had poor concentration, 31.8% were depressed, 53% were irritable and 2.6% had suicidal tendencies.

Conclusion and Recommendation: There was a high proportion of dysmenorrhea and also girls were very much worried about it. There is a need to educate them about causes, treatment and also to cope with stress at the time of menstrual cycle.

Keywords: Dysmenorrhea, Risk factors, Life style.

Introduction

Dysmenorrhea is the leading cause of recurrent short-term school absence in adolescent girls and a common problem in women of reproductive age. The prevalence of dysmenorrhea is highest in adolescent women, with estimates ranging from 20 to 90%, depending on the measurement method used.¹⁻³ About 15% of adolescent girls report severe dysmenorrhea,^{1,4} and it is the leading cause of recurrent short-term school absenteeism in

adolescent girls in the United States.^{2,5} A longitudinal study⁶ of a representative cohort of Swedish women found a prevalence of dysmenorrhea of 90% in women 19 years of age and 67% in women 24 years of age. 10% of the 24-year-olds reported pain that interfered with daily function. Most adolescents self-medicate with over-the-counter medicines, and few consult a physician about dysmenorrhea.¹⁻³

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Primary dysmenorrhea, which is defined as painful menses in women with normal pelvic anatomy, usually begins during adolescence. It is characterized by crampy pelvic pain beginning shortly before or at the onset of menses and lasting one to three days. Dysmenorrhea also may be secondary to pelvic organ pathology. In most patients who present with menstrual pain, empiric therapy may be prescribed with the presumptive diagnosis of primary dysmenorrhea, based on a typical history of low anterior pelvic pain beginning in adolescence and associated specifically with menstrual periods. A history that is inconsistent and/or physical findings of a pelvic mass, abnormal vaginal discharge, or pelvic tenderness that is not limited to the time of the menstrual period suggests a diagnosis of secondary dysmenorrhea.

Symptoms often co-occurring with menstrual pain include nausea and vomiting, diarrhea or constipation, headache, dizziness, disorientation, hypersensitivity to sound, light, smell and touch, fainting, and fatigue. Symptoms of dysmenorrhea often begin immediately following ovulation and can last until the end of menstruation. This is because dysmenorrhea is often associated with changes in hormonal levels in the body that occur with ovulation. The use of certain types of birth control pills can prevent the symptoms of dysmenorrhea, because the birth control pills stop ovulation from occurring. Risk factors associated with dysmenorrhea include: age younger than 20, early onset of puberty (age 11 or younger), heavy bleeding during periods (menorrhagia), irregular menstrual bleeding (metrorrhagia), never having delivered a baby, family history of dysmenorrhea, smoking and sedentary lifestyle. With this background, a cross-sectional study was conducted to find the proportion of dysmenorrhea among health care providers and associated risk factors.

Objectives

- 1) To find the proportion of dysmenorrhea among girls of a nursing college.
- 2) To find out the risk factors and impact of dysmenorrhea.

Material and Methods

A cross-sectional study was conducted from November 2011 to April 2012 at Nursing College, Vijayanagar Institute of Medical Sciences, Bellary, Karnataka. All the nursing girls of Vijayanagar Institute of Medical Sciences, Bellary, were included in the study. The number of students studying in the college was 245; out of them 219 were girls. The study was performed on a total of 196 students who agreed to participate and

present at the time of study. Study was conducted after obtaining the clearance from the Institutional Ethical Committee. Data were collected by pre-tested and pre-designed semi-structured pro forma after taking their written consent. Analysis was done by using Epi-info version 3.4.3

The Study Variables

Age, religion, education, socioeconomic status, marital status, age of menarche, menstrual cycle, duration of flow, amount of flow, family history of dysmenorrhea, related gynecological problems, regular exercise, body mass index, poor concentration, college absenteeism, class absenteeism, poor results, irritable, social withdrawal, depressed and sleepiness.

Results

In this study, the authors found that majority were aged about 17 to 20 years, belonged to Hindu religion, having diploma, unmarried and belonged to lower middle class according to modified BG Prasad classification.

Age	Frequency (196)	Percentage
17-20	177	90.3
21-25	14	7.1
26-30	5	2.6
Religion		
Hindu	171	87.2
Muslim	16	8.2
Christian	9	4.6
Education		
Degree	46	23.5
Diploma	113	57.7
SSLC	37	18.9
Marital Status		
Married	13	6.6
Unmarried	183	93.4
Socio-Economic class		
Upper class	20	10.2
Upper middle	33	16.8
Lower middle	58	29.6
Upper lower	46	23.5
Lower class	39	19.9

Table 1. Sociodemographic Profile of Study Subjects

Dysmenorrhea was present for 77% of the study subjects. The main reasons for dysmenorrhea were early age of menarche, irregular menstrual cycle, abnormal duration of flow, abnormal amount of flow, family history of dysmenorrhea, presence of related gynecological problems, lack of exercise and overweight. However except family history of dysmenorrhea, other factors were statistically not significant.

Risk factors	Total 196 (100%)	DP (%)*	DA (%)*	Odds ratio	95% CI	P value
		151 (77%)	45 (23%)			
Age at menarche						
Normal	165 (84.1)	127 (77)	38 (23)	1	-	-
Early	23 (11.7)	19 (82.6)	4 (17.4)	1.42	0.45-4.4	0.54
Late	8 (4.1)	5 (62.5)	3 (37.5)	0.49	0.11-2.18	0.35
Menstrual cycle						
Regular	162 (82.6)	122 (75.3)	40 (24.7)	1	-	-
Irregular	34 (17.4)	29 (85.3)	5 (14.7)	1.9	0.6-5.2	0.21
Duration of flow						
Normal	148 (75.5)	111 (75)	37 (35)	1	-	-
Abnormal	48 (24.5)	40 (83.3)	8 (16.7)	1.6	0.7-3.8	0.23
Amount of flow						
Normal	189 (96.4)	144 (76.2)	45 (23.8)	1	-	-
Abnormal	7 (3.6)	7 (100)	0 (0)	-	-	0.15**
Family history of dysmenorrhea						
Present	85 (43.3)	72 (84.7)	13 (15.3)	2.24	1.0-4.6	0.02
Absent	121 (56.7)	79 (71.2)	32 (28.8)	1	-	-
Related gynecological problems						
Present	6 (3.1)	6 (100)	0 (0)	-	-	0.24**
Absent	190 (96.9)	145 (76.3)	45 (23.7)	1	-	-
Exercise						
Yes	33 (16.8)	25 (75.8)	8 (24.2)	1	-	-
No	163 (83.2)	126 (77.3)	37 (22.7)	1.08	0.4-2.6	0.84
BMI						
Normal	107 (54.6)	84 (78.5)	23 (21.5)	1	-	-
Under weight	75 (38.2)	55 (73.3)	20 (26.7)	0.75	0.3-1.4	0.41
Over weight	14 (7.2)	12 (85.7)	2 (14.3)	1.6	0.3-7.8	0.53

*DP=Dysmenorrhea Present; DA=Dysmenorrhea Absent; ** Fisher Exact Test

Table 2.Risk Factors for Dysmenorrhea

Grading	Total (151)	Yes (%)	No (%)	Odds ratio	95% CI	P value
Poor concentration						
Mild	41 (27.1)	19 (46.3)	22 (53.7)	1	-	-
Moderate	80 (52.9)	32 (40)	48 (60)	0.7	0.3-1.6	0.5
Severe	30 (20.0)	16 (53.3)	14 (46.7)	1.3	0.5-3.4	0.5
College absenteeism						
Mild	41 (27.1)	3 (7.3)	38 (92.7)	1	-	-
Moderate	80 (52.9)	16 (20)	64 (80)	3.16	0.8-11.5	0.08
Severe	30 (20.0)	16 (53.3)	14 (46.7)	14.47	3.6-57.3	0.00
Class absenteeism						
Mild	41 (27.1)	2 (4.9)	39 (95.1)	1	-	-
Moderate	80 (52.9)	16 (20)	64 (80)	4.8	1.0-22.3	0.04
Severe	30 (20.0)	13 (43.3)	17 (56.7)	14.9	3.02-73.4	0.00
Poor results						
Mild	41 (27.1)	3 (7.3)	38 (92.7)	1	-	-
Moderate	80 (52.9)	10 (12.5)	70 (87.5)	1.8	0.4-6.9	0.38
Severe	30 (20.0)	4 (13.3)	26 (86.7)	1.9	0.4-9.3	0.40

Table 3.Impact of Dysmenorrhea on Academic Activities

When compared to the subjects with mild and moderate grade of dysmenorrhea, the subjects with severe grade of dysmenorrhea had poor concentration, college absenteeism, class absenteeism, poor results. Among them for college absenteeism and class absenteeism severe grade was found significant.

When compared to the subjects with mild and moderate grade of dysmenorrhea, the subjects with severe grade of dysmenorrhea were more irritable, had social withdrawal, depressed, and were more sleepy. Among them, presence of irritability, depression and more sleepy, the severe grade was found significant.

Grading	Total (151)	Yes (%)	No (%)	Odds ratio	95% CI	P value
Irritable						
Mild	41 (27.1)	15 (36.6)	26 (63.4)	1	-	-
Moderate	80 (52.9)	44 (55)	36 (45)	2.1	0.9–4.5	0.06
Severe	30 (20.0)	21 (70)	9 (30)	4.04	1.4–11.06	0.00
Social withdrawal						
Mild	41 (27.1)	9 (22)	32 (78)	1	-	-
Moderate	80 (52.9)	24 (30)	56 (70)	1.5	0.6–3.6	0.34
Severe	30 (20.0)	11 (36.7)	19 (63.3)	2.05	0.7–5.8	0.17
Depressed						
Mild	41 (27.1)	4 (9.8)	37 (90.2)	1	-	-
Moderate	80 (52.9)	27 (33.8)	53 (66.6)	4.7	1.5–14.5	0.00
Severe	30 (20.0)	17 (56.7)	13(43.3)	12.09	3.4–42.5	0.00
Sleepiness						
Mild	41 (27.1)	5 (12.2)	36 (87.8)	1	-	-
Moderate	80 (52.9)	31 (38.8)	49 (61.3)	4.5	1.6–12.8	0.00
Severe	30 (20.0)	12 (40)	18 (60)	4.8	1.4–15.7	0.00

Table 4. Impact of Dysmenorrhea on Mental and Social Health

Discussion

In this study, it was found that dysmenorrhea was present for 77% of the study subjects. The main reasons for dysmenorrhea were early age of menarche, irregular menstrual cycle, abnormal duration of flow, abnormal amount of flow, family history of dysmenorrhea, presence of related gynecological problems, lack of exercise and overweight. When compared to the subjects with mild and moderate grade of dysmenorrhea, the subjects with severe grade of dysmenorrhea had poor concentration, college absenteeism, class absenteeism, poor results. When compared to the subjects with mild and moderate grade of dysmenorrhea, the subjects with severe grade of dysmenorrhea were more irritable, had social withdrawal, depressed, and were more sleepy.

A study conducted by Patel et al. More than half reported dysmenorrhea; moderate to severe dysmenorrhea was reported by 755 participants (33.4%, 95% CI 31.4–35.4). There was a linear association between severity of pain and impact (medication and taking rest) and the onset of pain (premenstrual onset associated with more severe pain). On multivariate analyses, the risk of moderate-severe dysmenorrhea was associated with the experience of violence (OR 2.23, 95% CI 1.5–3.4); other somatic complaints (OR 3.67, 95% CI 2.7–4.9 for highest somatoform symptom score category compared with the lowest); gynecological complaints (non-menstrual lower abdominal pain: OR 1.78, 95% CI 1.3–2.3; dysuria: OR 1.98, 1.4–2.7); menorrhagia (OR 1.92, 95% CI 1.4–2.6); and illiteracy (OR 1.32, 95% CI 1.0–1.7). Having had a pregnancy (OR 0.53, 95% CI 0.4–0.7), older age of menarche (OR 0.70, 95% CI 0.5–0.9, for age >14

compared with <13 years) and older age (OR 0.43, 0.3–0.6 for age 40–50, compared with 18–24 years) were protective.⁷

Another study conducted by Omidvar et al. found that mean age of the subjects at menarche was 13.36±1.25 years with a range being 10 to 17 years. Mean duration of menstrual flow was 4.77±1.06 days. The most prevalent menstrual symptoms were tiredness (47.9%), backache (38.3%), and anger (34.5%). Prevalence of menstrual irregularity and dysmenorrhea was 11.9 and 78.2%, which is almost similar to this study. 6.7% of the participants had severe dysmenorrhea. 76.6% of the dysmenorrhea girls reported that their working ability was affected. 60.4% of the girls were aware of menstruation prior to menarche. Mothers and friends were the main sources of information (47.8%).⁸

One more study done by Al-kind et al. found that Overall 94% (n=380) of the participants had dysmenorrhea. It was mild in 27% (n=104), moderate in 41% (n=155), and severe in 32% (n=121). Dysmenorrhea was the cause of limited sports activities in 81%, decreased class concentration in 75%, restricted homework in 59%, school absenteeism in 45%, limited social activities in 25%, and decreased academic performance in 8% of the affected students. Only 3% (n=10) had consulted a physician; 21% (n=80) self-medicated, and 55% (n=210) took no action. The commonest drugs used were paracetamol (n=60, 16%), ibuprofen (n=29, 8%) and mefenemic acid (n=12, 3%). There was no statistically significant correlation between dysmenorrhea, demographics and menstrual characteristics. Similar finding were found in the present study.⁹

Banikarim et al. found that among participants who had had a period in the previous 3 months, 85% reported dysmenorrhea, which is a little more compared to this study. Of these, 38% reported missing school due to dysmenorrhea during the 3 months prior to the survey and 33% reported missing individual classes. Activities affected by dysmenorrhea included class concentration (59%), sports (51%), class participation (50%), socialization (46%), homework (35%), test-taking skills (36%), and grades (29%). Treatments taken for dysmenorrhea included rest (58%), medications (52%), heating pad (26%), tea (20%), exercise (15%), and herbs (7%). 14% consulted a physician and 49% saw a school nurse for help with their symptoms. Menstrual pain was significantly associated with school absenteeism and decreased academic performance, sports participation, and socialization with peers ($P < 0.01$).¹⁰

Unsal et al. found that the average age of the study group was 20.8 ± 1.8 years (range 17–30). Prevalence of dysmenorrhea was found to be 72.7% which is a little less compared to this study and was significantly higher in coffee consumers, females with menstrual bleeding duration $> \text{or} = 7$ days, and those who had a positive family history of dysmenorrhea when compared to the others ($P < 0.05$, for each one).

By multivariate analysis, coffee consumption (OR 2.084), menstrual bleeding duration $> \text{or} = 7$ days (OR 1.590), and positive family history of dysmenorrhea (OR 3.043) were important risk factors for dysmenorrhea. Except for social functioning, role-emotional, and mental health domains, the SF-36 points received from the other domains were higher in females with dysmenorrhea (for each one $P < 0.05$).

With the exception of the scores received from physical functioning and role-emotional domains, the scores received from the other domains of the SF-36 scale showed a decrease with increasing severity of dysmenorrhea ($P < 0.05$, for each one). Dysmenorrhea is a common health problem, having negative effects on the HRQoL among university female students.¹¹

Tavallaee et al. found that the prevalence of no, mild, moderate, and severe menstrual pain was 10, 41, 28, and 22%, respectively. Older age and high intake of fruits and vegetables were protective factors for menstrual pain while women with family history of dysmenorrhea, higher stress and depression tended to have more severe pain. Body mass index, parity, smoking, and physical activity were not significantly associated with dysmenorrhea after controlling for potential confounding factors and effect modifiers.¹²

Lifestyle Modification

Few studies have examined the effect of lifestyle-modification interventions in the management of dysmenorrhea. One cross-over study of a low-fat vegetarian diet versus placebo pill showed decreased duration and intensity of dysmenorrhea in women in the intervention group.¹³ Although some studies have reported a benefit with exercise, the effect is questionable because participants were not blinded to the study hypothesis.¹⁴

Conclusion

The proportion of dysmenorrhea was 77%, family history of dysmenorrhea was found to be a significant risk factor. Impact of dysmenorrhea on their life style showed that the majority subjects who had moderate to severe dysmenorrhea were irritable and depressed; they also had poor academic results due to class and college absenteeism.

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Conflict of Interest: None

References

1. Davis AR, Westhoff CL. Primary dysmenorrhea in adolescent girls and treatment with oral contraceptives. *J Pediatr Adolesc Gynecol* 2001; 14: 3-8.
2. Banikarim C, Chacko MR, Kelder SH. Prevalence and impact of dysmenorrhea on Hispanic female adolescents. *Arch Pediatr Adolesc Med* 2000; 154: 1226-29.
3. Strinic T, Bukovic D, Pavelic L et al. Anthropological and clinical characteristics in adolescent women with dysmenorrhea. *Coll Antropol* 2003; 27: 707-11.
4. Andersch B, Milsom I. An epidemiologic study of young women with dysmenorrhea. *Am J Obstet Gynecol* 1982; 144: 655-60.
5. Klein JR, Litt IF. Epidemiology of adolescent dysmenorrhea. *Pediatrics* 1981; 68: 661-64.
6. Sundell G, Milsom I, Andersch B. Factors influencing the prevalence and severity of dysmenorrhea in young women. *Br J Obstet Gynaecol* 1990; 97: 588-94.

7. Patel V, Tanksale V, Sahasrabhojane M et al. The burden and determinants of dysmenorrhea: A population-based survey of 2262 women in Goa, India. *BJOG* Apr 2006; 113(4): 453-63.
8. Omidvar S, Begum K. Menstrual pattern among unmarried women from south India. *J Nat Sci Biol Med* Jul 2011; 2(2): 174-79.
9. Al-Kindi R, Al-Bulushi A. Prevalence and impact of dysmenorrhea among Omani high school students. *Sultan Qaboos Univ Med J* Nov 2011; 11(4): 485-91.
10. Banikarim C, Chacko MR, Kelder SH. Prevalence and impact of dysmenorrhea on Hispanic female adolescents. *Arch Pediatr Adolesc Med* Dec 2000; 154(12): 1226-29.
11. Unsal A, Ayranci U, Tozun M et al. Prevalence of dysmenorrhea and its effect on quality of life among a group of female university students. *Arch Pediatr Adolesc Med* 2000; 154: 1226-29.
12. Tavallaee M, Joffres MR, Corber SJ et al. The prevalence of menstrual pain and associated risk factors among Iranian women. *J Obstet Gynaecol Res* May 2011; 37(5): 442-51.
13. Malmstrom K, Kotey P, Cichanowitz N et al. Analgesic efficacy of etoricoxib in primary dysmenorrhea: Results of a randomized, controlled trial. *Gynecol Obstet Invest* 2003; 56: 65-69.
14. Proctor M, Farquhar C. Dysmenorrhea. *Clin Evid* 2002; (7): 1639-53.