

Prevalence and Impact of Dysmenorrhoea among Omani High School Students

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معدل انتشار وتأثير عسر الطمث لدى الطالبات العُمانية في المدارس الثانوية

رحمة الكندية وعنبرين البلوشية

الملخص: الهدف: تحديد معدل انتشار عسر الطمث وتأثيره والعلاج المستخدم لدى الطالبات العُمانية في المدارس الثانوية. الطريقة: أجريت هذه الدراسة المقطعية في شهر مايو 2010 على 404 طالبة من مدرستين من المدارس الثانوية العامة في منطقة مسقط، وتم جمع البيانات من خلال استبيان ذاتي يشمل معلومات عن الخصائص الديموغرافية، ومعدل انتشار عسر الطمث، وشدة، وأثره، والعلاج المستخدم. النتائج: دلت النتائج على معاناة 94% (380 طالبة) من المشاركات من عسر الطمث. كان عسر الطمث خفيفا لدى 27% (104 طالبة)، بينما كان متوسط الشدة لدى 41% (155 طالبة)، وشديدا لدى 32% (121 طالبة). وكان عسر الطمث سببا في قصور في الأنشطة الرياضية (81%)، وقلة التركيز في الصف (75%)، وتقييد في أداء الواجبات المنزلية (59%)، والتغيب عن المدرسة (45%)، وقصور في الأنشطة الاجتماعية (25%)، وانخفاض الأداء الأكاديمي (8%) لدى الطالبات المصابات. التمس 3% فقط (10 طالبات) طلب المشورة الطبية، بينما كان العلاج ذاتيا في 21% (80 طالبة)، والأكثرية منهن لم يحركن ساكنا - 55% (210 طالبة). كانت الأدوية المستخدمة هي الباراسيتامول (60 طالبة، 16%)، ايبوبروفين (29 طالبة، 8%) وحمض الميفيناميك (12 طالبة، 3%). لم يكن هناك أي ارتباط معتد بين عسر الطمث والخصائص الديموغرافية وخصائص الدورة الشهرية. الخلاصة: رغم انتشار عسر الطمث بين الطالبات العُمانية في المدارس الثانوية إلا أنه لم يلق العلاج اللازم. الألام المصاحبة لعسر الطمث يمكن أن تكون شديدة ومعيقة ولذلك ينبغي على الأطباء أن يكونوا على استعداد لمناقشة هذا بحرية أكبر مع طالبات المدارس. بالإضافة إلى ذلك هناك حاجة للتثقيف بخصوص عسر الطمث وخيارات العلاج للتقليل من أثره على الأنشطة المدرسية والرياضية والاجتماعية واليومية.

مفتاح الكلمات: عسر الطمث، آلام الحيض، معدل انتشار، تأثير، الفتيات المراهقات، المدرسة الثانوية، الطلاب، عُمان.

ABSTRACT: Objectives: The objectives of this study were to determine the prevalence of dysmenorrhoea in Omani high schoolgirls, its impact and the treatment used. **Methods:** A cross-sectional survey was carried out in May 2010 on 404 girls from two public high schools in the Muscat region. Data were collected by self-administered questionnaire including information on demographics, prevalence of dysmenorrhoea, severity, its impact, and the treatment used. **Results:** Overall, 94% (n = 380) of the participants had dysmenorrhoea. It was mild in 27% (n = 104), moderate in 41% (n = 155), and severe in 32% (n = 121). Dysmenorrhoea 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 dysmenorrhoea, demographics and menstrual characteristics. **Conclusion:** Dysmenorrhoea is a prevalent and yet undertreated menstrual disorder among Omani adolescent schoolgirls. The pain suffered can be severe and disabling. Doctors should therefore be prepared to discuss this more freely with schoolgirls. In addition, there is a need for education regarding dysmenorrhoea and treatment options to minimise the impact on school, sports, social and daily activities.

Keywords: Dysmenorrhoea; Painful menstruation; Prevalence; Impact; Adolescent girls; High school; Students; Oman.

ADVANCES IN KNOWLEDGE

1. This study is the first in Arabian Gulf countries to explore the prevalence of dysmenorrhoea in adolescent girls in high school.
2. This study has shown both a high prevalence of dysmenorrhoea and its huge impact on schoolgirls both academically and socially. However, adolescent schoolgirls seem reluctant to seek medical help for this problem.
3. This study will improve awareness among health care providers and allow them to be more sensitive to issues related to the management

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of dysmenorrhoea.

4. This study can encourage further research to identify and determine the associated risk factors of dysmenorrhoea.
5. The results of this study could be used for better understanding of the epidemiology of dysmenorrhoea and its effect on public health.

APPLICATION TO PATIENT CARE

1. The information that dysmenorrhoea is a common menstrual disorder among adolescent schoolgirls needs to be disseminated to the public and health professionals by: a) Educating health professionals about dysmenorrhoea, its severity and impact on adolescent schoolgirls; b) Encouraging doctors to screen routinely for dysmenorrhoea among adolescent schoolgirls and offer treatment if necessary; and c) Encouraging adolescent schoolgirls to consult their physicians for dysmenorrhoea.
2. There is a need for health education measures in this area to prevent unnecessary suffering and interruption in the adolescent's education. The introduction in the school curriculum of culture-specific education regarding menstrual disorders and the use of appropriate medication is recommended for effective relief of dysmenorrhoea.

DYSMENORRHOEA, OR PAINFUL menstruation, is defined as painful cramps that begin a few hours before the onset of bleeding and may persist for hours or days. Dysmenorrhoea may be either primary, when there is no identifiable cause, or secondary to organic pelvic diseases. Primary dysmenorrhoea occurs typically between 17 and 22 years of age while secondary dysmenorrhoea is more common in older women. Dysmenorrhoea is commonly associated with systemic symptoms like lower back pain, nausea, vomiting, diarrhoea, fatigue and headache. The cause of primary dysmenorrhoea has yet to be established. It has been attributed to uterine contractions with ischaemia and production of prostaglandin. Based on the patient's history, it is important to differentiate between dysmenorrhoea and premenstrual syndrome (PMS). PMS starts before the menstrual cycle and stops shortly after menstrual flow begins. The symptoms associated with PMS are more likely to be abdominal bloating and breast heaviness rather than lower abdominal cramps.¹

Dysmenorrhoea is a common gynaecological complaint among adolescents and young adults. The prevalence rates reported for dysmenorrhoea vary widely across studies due to the differences in measurement methods. Prevalence rates have been reported to be as high as 93%² and as low as 16%.³ In the Middle East, the prevalence of dysmenorrhoea in Egypt has been estimated to be 75%.⁴

Many adolescents consider dysmenorrhoea to be a normal part of the menstrual cycle and thus fail to report their pain to their physicians. The consequences of untreated primary dysmenorrhoea range from school absenteeism⁵⁻⁸ to disruption of relationships with family and friends.^{8,9}

The risk factors reported in the literature for

dysmenorrhoea are: age <20, nulliparity, higher/upper socioeconomic status, heavy menses, attempts to lose weight, physical activity, smoking, disruption of social networks, depression and anxiety;¹⁰ however, studies have been quite heterogeneous in terms of association.

Although dysmenorrhoea is an important public health problem, there has, to our knowledge, not been any data published from Oman. In order to lay the groundwork for such an undertaking, studies are needed to establish the prevalence of dysmenorrhoea in adolescent Omani girls. The bulk of the population in Oman is in the adolescent age group.¹¹ Therefore, this study aims to quantify the prevalence of dysmenorrhoea in adolescent schoolgirls and its impact on school performance as well as the treatments used. An integral part of the present study is to ascertain the associated risk factors among adolescent schoolgirls with dysmenorrhoea.

Methods

A cross-sectional survey was carried out in two female public high schools, namely Al Hail Alawamir and Omama bint Alaas, in May 2010. The two schools were randomly selected out of four high schools in the Al Seeb area of the Muscat region. Like most of the high schools in the Muscat region, each school has around 1,500 students in 50 classes of grades 11 and 12, the students' ages ranging from 15 to 23. In each school, 4 classes from each grade were randomly selected. A total of 16 classes were studied. The survey was conducted during school hours and included a total of 404 students.

A pre-tested and structured questionnaire was developed by the authors based on a pilot study and thorough review of relevant literature addressing

the prevalence and severity of dysmenorrhoea, the impact of dysmenorrhoea on daily activities and the prevailing management strategies.²⁻¹⁰ The participants were briefed on the objectives of the study and the definition of dysmenorrhoea was explained as any lower abdominal pain or discomfort associated with the menstrual period. The degree of pain was categorised by a multidimensional scoring system as mild, moderate and severe based on pain, limitation of activities and medications taken.¹² Mild pain was defined as “painful menstruation that seldom inhibits normal activity and analgesics are seldom required”; moderate pain as “painful menstruation that affects daily activities and analgesics are required and give relief”; severe pain as “painful menstruation that clearly inhibits daily activities and the pain is not totally relieved by analgesics”.¹² The amount of bleeding was defined depending on the number of pads used per day as little (<4 pads per day), moderate (5–10 pads per day) and heavy (2 pads at a time).¹³

Information was gathered on the students' age, grade, residency, and family history of dysmenorrhoea. Questions related to menstruation elucidated their age at menarche, regularity of the cycle, length and duration of the cycle, amount of bleeding (little, moderate or heavy), pain during menstruation, severity of the pain (mild, moderate or severe), associated symptoms, premenstrual symptoms, their impact on daily activities and absenteeism from school, and treatment taken, if any. The weight and height of the participants was measured by the researchers and/or trained research assistants. The cut-off points for body mass index (BMI) were based on recommendations by the World Health Organization's (WHO) Expert Committee on Physical Status.¹⁴ Data was collected using a self-administered questionnaire. The researchers and/or research assistants were available on site to assist the students in completing the questionnaire which took 20 to 30 minutes. Students who had not yet experienced the menarche, or had gynaecological diseases, had had abdominal or pelvic surgery, or refused to give consent, were excluded from the analysis.

The participation was therefore on a voluntarily basis with written consent being taken before initiating the data collection. Anonymity and confidentiality was assured and emphasised. Ethical approval for the study was granted by the Medical

Research and Ethics Committee of Sultan Qaboos University, College of Medicine and Health Sciences in 2010. Permission to distribute the questionnaires in schools was obtained from the Directorate General of Muscat Region, Ministry of Education.

STATA software (StataCorp LP, Texas, USA, Version 10) was used for data entry and analysis. Frequencies and percentages were computed for discrete variables and the mean and standard deviation were computed for continuous variables. The Pearson's χ^2 tests (or Fisher's exact tests for cells less than 5) were used as appropriate to test the association between dysmenorrhoea and the studied variables. The 5% level of significance was taken to test the significance of the obtained results.

Results

This study included a total of 404 Omani students; 200 (49.5%) were from Al Hail Al Awamir School and 204 (50.5%) were from Omama bint Alaas School. Nearly two thirds of participants ($n = 259$, 64%) were in grade 12 and one third ($n = 145$, 36%) were in grade 11. Their ages ranged from 15 to 23 years, with a mean of 17.50 (± 0.98) years. The vast majority of students were originally from the Muscat region ($n = 344$, 85%). Nearly half of the participants ($n = 212$, 52%) were of normal weight; 90 (22%) were underweight and 102 (25%) were overweight and/or obese. The age at menarche ranged from 9 to 17 years. The mean age at menarche was 13.00 (± 1.31) years. The sociodemographic data and characteristics of the menstrual cycle are given in Table 1.

Regular cycles were reported by 59% ($n = 237$) of the students; a cycle duration of 21 to 35 days was reported by 89% ($n = 359$); menstrual duration of 2 to 7 days was reported by 88% ($n = 354$), and little to moderate flow was reported by 95% ($n = 382$). The overall prevalence of dysmenorrhoea was 94% ($n = 380$). Of the participants with dysmenorrhoea, the pain experienced was reported as mild by 27% ($n = 104$); moderate by 41% ($n = 155$), and severe by 32% ($n = 121$). There was no statistically significant correlation between dysmenorrhoea and the following: age at menarche, regularity of the cycle, length and duration of the cycle, reported amount of flow, BMI, and family history of dysmenorrhoea at ($P = >0.05$) [Table 1].

All the participants with dysmenorrhoea

Table 1: Factors associated with dysmenorrhoea

Characteristics	Total Frequency (n = 404)	Presence of dysmenorrhoea		P value
		Yes n = 380 (94.06%)	No n = 24 (5.94%)	
Age, n (%)				
15–17	203 (50)	192 (51)	11 (46)	0.656
18–23	201 (50)	188 (49)	13 (54)	
School, n (%)				
1	200 (50)	190 (50)	10 (42)	0.428
2	204 (50)	190 (50)	14 (58)	
Grade, n (%)				
11	145 (36)	139 (37)	6 (25)	0.251
12	259 (64)	241 (63)	18 (75)	
Body Mass Index (BMI), n (%)				
Underweight <18.50	90 (22)	83 (22)	7 (29)	0.684
Average weight 18.50–24.99	212 (52)	201 (53)	11 (46)	
Overweight/Obesity ≥25.00	102 (25)	96 (25)	6 (25)	
Menarche, n (%)				
<13	132 (33)	124 (33)	8 (33)	1.000
13–14	231 (57)	217 (57)	14 (58)	
>14	41 (10)	39 (10)	2 (8)	
Regularity, n (%)				
Yes	237 (59)	226 (59)	11 (46)	0.188
Duration of bleeding (days), n (%)				
2–7 days	354 (88)	334 (88)	20 (83)	0.510
8–14 days	50 (12)	46 (12)	4 (17)	
Length of cycle (days), n (%)				
<21 days	21 (5)	21 (6)	0 (0)	0.7
21–35 days	359 (89)	336 (88)	23 (96)	
>35 days	24 (6)	23 (6)	1 (4)	
Amount of blood flow/cycle, n (%)				
Little (1–4 pads/day)	253 (63)	234 (62)	19 (79)	0.077
Moderate (5–10 pads/day)	129 (32)	126 (33)	3 (13)	
Heavy (2 pads at a time)	22 (5)	20 (5)	2 (8)	
Family history of dysmenorrhoea, n (%)				
Yes	338 (84)	317 (83)	21 (88)	0.428

reported some associated symptoms. The most frequently reported symptoms were backache (n = 302, 79%), stomach cramps (n = 266, 70%) and

mood changes (n = 260, 68%). Table 2 shows the most commonly reported symptoms associated with dysmenorrhoea. A total of 39% percent of the

Table 2: Percentage of participants with dysmenorrhoea who suffer from associated symptoms (more than one symptom per person)

Symptoms	Participants with associated symptoms (n = 380)	
	n	%
Backache	302	79.5
Stomach cramps	266	70.0
Mood change	260	68.4
Myalgia	227	59.7
Fatigue	194	51.1
Nausea	157	41.3
Headache	139	36.6
Dizziness	100	26.3
Diarrhea	92	24.2
Vomiting	61	16.1
Edema	19	5.0

participants (n = 147) suffered from some form of PMS, of which the majority reported backache (n = 103, 27%) and/or irritability (n = 90, 24%). The other symptoms reported were loss of appetite (n = 74, 19%), gastrointestinal symptoms (n = 68, 18%), abdominal bloating (n = 63, 17%), headache (n = 56, 15%), breast heaviness (n = 50, 13%) and skin changes (n = 19, 5%). Over two thirds of the participants (n = 276, 73%) had not sought treatment for their pain, with only 3% (n = 10) having consulted a physician. The majority of participants with dysmenorrhoea (n = 300, 79%) did not take any medications. Paracetamol (n = 60, 16%), ibuprofen (n = 29, 8%) and mefenamic acid (n = 12, 3%) were the most commonly used analgesics. Others reported using complementary and alternative medicine in the form of herbs (n = 47, 12%) and a heating pad (n = 45, 12%).

Almost all the participants with dysmenorrhoea (n = 377, 99%) reported that the pain adversely affected their daily activities. Among the participants, 308 (81%) limited their sports activities, 285 (75%) reported decreased concentration in the classroom, and 226 (59%) complained of a diminished ability to do homework. There were 170 (45%) students who endorsed the idea that dysmenorrhoea made them miss classes, 94 (25%) reported a limitation of social activities and 32 (8%) had experienced decreased academic performance.

Discussion

This study provides new information not previously available from Oman, or even from the neighbouring Arab/Islamic countries of the Gulf, on the prevalence, impact and treatment of dysmenorrhoea in adolescent high schoolgirls. This study found the prevalence of dysmenorrhoea in girls in high school to be 94% of the cohort surveyed. Estimates of the prevalence of dysmenorrhoea range between 16%³ and 93%.² The rate of dysmenorrhoea revealed by the present study is comparable to the 90–93% reported from USA,¹⁵ Iran,¹⁶ and Canada,² but it is higher than the rates reported from Egypt,⁴ Nigeria,⁶ Turkey⁸ and India¹⁷ that ranged between 25–80%. The wide variation in these estimates may be attributed to the use of differently selected groups of subjects^{12,18} and the absence of a universally accepted definition of dysmenorrhoea and system for grading its severity.^{15,19} Another reason for the variation could be due to ethnic and sociocultural factors. Differences among ethnic groups have been reported in Western²⁰ as well as Asian communities;⁵ however, it remained unclear whether the variation was related to biological or cultural factors.⁵

Of this study population, 32% reported having severe dysmenorrhoea which is twice the prevalence reported in a similar study in Egypt.⁴ More than two third of the participants (73%) described their pain as moderate to severe. This indicates that although dysmenorrhoea may be a furtive illness, its prevalence is high and therefore has an implication on the quality of life and public health.

Some studies have shown a link between dysmenorrhoea and several risk factors including early menarche, irregular or long cycles and heavy menses.^{12,18} However, this study did not find any significant association between dysmenorrhoea and age at menarche, regularity of the cycle, length and duration of the cycle, amount of flow, BMI, or family history of dysmenorrhoea. This could be due to the small sample size, a very homogenous group and the fact that pain is experienced subjectively and therefore difficult to measure. It remained unclear if the high prevalence of dysmenorrhoea among Omani high schoolgirls in our study is related to biological or cultural factors, and further studies are needed to explore these issues.

Dysmenorrhoea is known to be associated with

a wide variety of physical symptoms. Backache and stomach cramps were the two most common reported symptoms in our study, and similar to findings elsewhere in the literature.^{3,4,21} On the other hand, PMS is also known to be associated with a wide variety of symptoms like abdominal bloating and breast heaviness. The distinction between the two may not have been clear to the participants thus leading to over-reporting of dysmenorrhoea.

The results clearly showed that dysmenorrhoea adversely affected the students' daily activities. Dysmenorrhoea had an adverse effect on school performance reflected in low concentration during classes, difficulties in accomplishing homework and school absenteeism. It also limited participation in sports and social activities. This is consistent across different cultures, supporting an underlying biological origin of dysmenorrhoea.

Despite the considerable impact of dysmenorrhoea, both academically and socially, only 3% of the participants with dysmenorrhoea had consulted a doctor about it. This is consistent with other findings that most adolescents with dysmenorrhoea do not consult a health care provider.^{4,22-24} We found that 21% (n = 80) of the participants self-medicated by drugs like paracetamol, ibuprofen and mefenemic acid. The low rates of self-treatment and physician consultation rates may be due to the sensitive nature of dysmenorrhoea among adolescent girls, conservative social values and cultural beliefs, and the reluctance of young unmarried girls to consult a physician, particularly a male physician. We also found that more than half of the participants did nothing to alleviate their pain. Likewise, studies in Egypt,⁴ Nigeria,⁶ Turkey⁸ and India¹⁷ reported that more than half of the adolescents studied did not seek treatment for dysmenorrhoea. This may suggest that there is a significant lack of awareness and knowledge among adolescent girls regarding treatment for dysmenorrhoea.²⁵ Our study did not investigate barriers to seeking medical attention for dysmenorrhoea; nevertheless, the participants' responses indicated that many girls accept dysmenorrhoea as a normal aspect of the menstrual cycle and believe that it cannot be treated. These ideas likely provided the rationale for not seeking medical treatment. Improving the girls' knowledge about dysmenorrhoea could therefore positively influence their healthcare-seeking

behaviour. Health promotion in the primary health care setting or at school may be an efficient way of achieving this.

There are several limitations to the current study. Although girls with potential causes of secondary dysmenorrhoea were excluded from the study sample, it was not possible to discriminate between primary and secondary dysmenorrhoea in this study population. In addition, despite the fact that the definition of dysmenorrhoea was explained before the questionnaires were completed, some of the responses may reflect general experience rather than specific menstrual discomfort. The self-reporting nature of this study may have resulted in recall bias and over-reporting of the condition. Besides, it is possible that some of the participants completed their questionnaires with peers, which may have biased their responses. Finally, this study was conducted in only two schools of Muscat region; the results may therefore not be generalisable to other regions or to the entire country.

Conclusion

This study unequivocally suggests a high prevalence of dysmenorrhoea among Omani girls in high school indicating that it is a significant health problem needing attention. Young girls are unlikely to discuss dysmenorrhoea with their family physician, or seek painkillers available over the counter. They seem to accept dysmenorrhoea and its consequences as part of the physiological process of the transition between adolescence and adulthood. This reflects a shortage of information about primary dysmenorrhoea targeted at female adolescents. Health education on issues related to reproductive health should be incorporated early enough in the school curriculum to prepare girls for menstruation and inform them about available treatment options in case they experience dysmenorrhoea. A number of professionals can play a crucial role in educating young people especially family physicians and school personnel.

CONFLICT OF INTEREST

The authors reported no conflict of interest.

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