

# Prevalence of Dysmenorrhea among Female Adolescents in Dubai: A Cross-Sectional Study

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## Abstract

**Objective:** This study aimed to investigate the prevalence of dysmenorrhea among adolescents in Dubai, and its effect on their academic and athletic performance. **Methods:** This was a cross-sectional study conducted in ten randomly selected private and government high schools in Dubai, United Arab Emirates. Using both the English and Arabic translated version of the Women's Health Symptom Survey Questionnaire World, data was collected from 456 female students of grades 7 - 12, aged 11 - 19 years. **Results:** Dysmenorrhea was a crucial problem reported by 432 (94.7%) of the participants. Of the total number, 208 (45%) participants reported experiencing severe pain during menstruation and 152 (33.4%) students reported being absent from school during every menstrual cycle. Nonsteroidal anti-inflammatory drugs (NSAIDs) were used by 147 (32.3%) students, and majority reported no or little improvement. The percentage of students who experienced menstrual pain with micturition or defecation was 43.1% and 46.7%, respectively. None of the participants reported the use of hormonal agents. **Conclusion:** The unexpected high number of female adolescents who reported symptoms of primary dysmenorrhea necessitating treatment, as well as subsequent school absenteeism, calls for implementation of a screening questionnaire for early detection of persistent primary dysmenorrhea. Moving from surgical to clinical diagnosis of endometriosis can contribute greatly to improving the quality of life and reproductivity of female adolescents with severe dysmenorrhea.

## Keywords

Adolescence, Dysmenorrhea, Endometriosis, Menstruation, Dubai, UAE

## 1. Introduction

Dysmenorrhea in adolescents is a real dilemma, due to the existence of diagnostic challenges encountered during the investigation pathway, to identify any underlying cause.

In the majority of these cases, no underlying cause could be identified except primary dysmenorrhea. In 10%, dysmenorrhea will be secondary to another underlying pathology, mostly endometriosis or uterine anomalies [1]. Dysmenorrhea which involves pain during menstruation is a perturbing symptom that impairs the quality of life. The highest rate of dysmenorrhea is reported among adolescents. Therefore, it is considered the major reason for school absenteeism and limitation in activities that will ultimately result in poor academic performance and long-term burden on the national economic budget [2].

Over a century has passed since endometriosis was first described by von Rokitansky in 1860. However, endometriosis is still not less of an enigmatic disease, where little progress has been done to identify the pathogenesis, or to find a cure for this disease [3].

Owing to its chronic nature, endometriosis mostly can worsen over years, causing permanent damage to the female reproductive system. In addition, the perception of severe menstrual pain during adolescence has been historically “normalized” as a normal association with the menstrual cycle. Hence, it does not come as a surprise the recent publications showing advanced Endometriotic disease among young females during investigations for delayed conception [1].

Stella *et al.* conducted an extensive literature review in Sweden and found that dysmenorrhea leads to a total loss of 230,000 working days, which causes a huge financial loss [4].

Majority of adolescents suffer from primary dysmenorrhea, where no underlying cause could be identified. However, researchers suggest that abnormally high prostaglandin levels could be the underlying cause [5]. Persistence and/or severity of dysmenorrhea should prompt investigations to identify any underlying cause that could reveal secondary dysmenorrhea [6].

Endometriosis was found in 62% of adolescents with secondary dysmenorrhea. In endometriosis, active endometrial glands and stroma are distributed in the pelvic cavity [4], and can respond to hormonal influences. There is an intraperitoneal bleeding that mimics menstruation, which results in an intense and progressive inflammatory process [7], constituting the cornerstone of the dense adhesions. This leads to a permanent destruction of the anatomical and functional potential of the reproductive capacity in adolescents [8].

Regardless of the type of dysmenorrhea, its severity produces a debilitating effect that persists for a few days and recurs every month [4]. Adolescents with moderate to severe dysmenorrhea fail to enjoy activities of daily livings and may absent themselves from school [9]. Repeated absenteeism will ultimately result in poor school performance that will subsequently have a negative effect on the productivity of society [10]. Increasing evidence confirms that severe dysmenorr-

hea is a grave symptom that will have an unfavourable outcome on academic and athletic progress [11].

The prevalence of dysmenorrhea varies worldwide. The reported incidence in 2017 was 72.2%, 89.1%, and 65%, among adolescents in Turkey, Iran, and India, respectively [12], with similar incidence in gulf countries; however, data for the United Arab Emirates (UAE) are sparse. Reviewed literature revealed that the diagnosis of endometriosis was confirmed laparoscopically in 47% - 73% of adolescents with chronic pelvic pain, who did not respond to medical treatment [13]. This shows that diagnosing endometriosis is not easy, and requires about 12 years for the diagnosis. This difficulty is due to lack of screening tools. In addition, many adolescents perceive severe dysmenorrhea as a normal variant [14]. Therefore, every effort should be made to differentiate between primary and secondary dysmenorrhea to prevent severe outcomes [15].

Adenomyosis, is another possible reason for secondary dysmenorrhea in adolescence, where the endometrium invades the myometrium. Advances in imaging have led to the diagnosis of the disease among adolescents [16]. These findings may reveal that primary dysmenorrhea can be an early stage of adenomyosis [17].

In adolescents presenting with dysmenorrhea, symptomatic treatment should be initiated. Such treatments could involve non-steroidal Anti-inflammatory drugs (NSAIDs) and/or hormonal treatment [18]. Unresolved symptoms after 3 - 6 months necessitate further investigations for possible secondary causes [ACOG Committee Opinion 760] (Figure 1) [6].

This study aimed at investigating the prevalence of dysmenorrhea in Dubai and its effect on academic and athletic performance among participants.

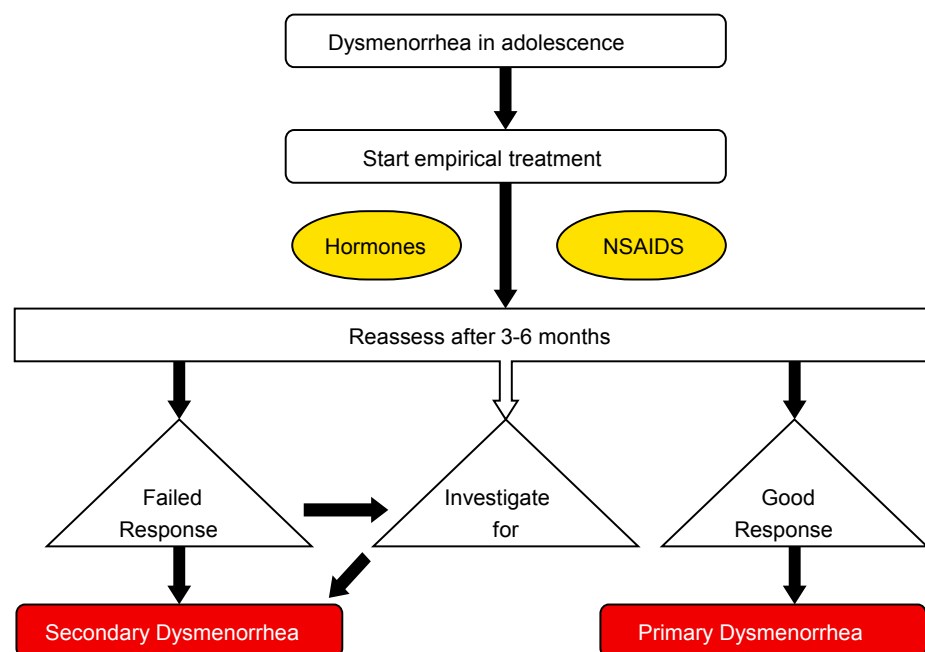


Figure 1. Dysmenorrhea management algorithm.

## 2. Methods

### 2.1. Subjects and Setting

Using a cross-sectional study design, students were randomly recruited from different high schools in Dubai, from both the government and private sectors, to participate in the study during the period between May 2018 to May 2019 academic year. A total of 10 schools participated, of which six were government schools and four were private schools. A total of 470 students were approached. Fourteen were excluded since they did not attain menarche. Therefore, 456 girl students in grades 7 - 12, aged 11 - 19 who met the inclusion criteria, *i.e.* those who started menstruating and those who agreed to participate in the study, were requested to complete a self-administered questionnaire written in both English and Arabic to match students' preferences. The questionnaires were filled in their schools to allow further clarification where needed.

Written informed consent was obtained from parents and school authorities prior to the commencement of the study.

### 2.2. Questionnaire and Other Materials

A questionnaire was prepared in English and Arabic version, based on questions obtained from the World Endometriosis Research Foundation using the Women's Health Symptom Survey Questionnaire [19].

The questionnaire was filled by 30 high school students and assessed prior to the study. Based on the feedback, modifications were made for difficult statements. Content validity was reviewed by two experts in this field.

Irrelevant questions for the study age group were excluded, considering the cultural and ethnic background of the country. Those questions were related to the use of contraception, occurrence of pregnancy, and information regarding sexual activity. The final questionnaire composed of 29 questions divided into three sections. The questionnaire included sociodemographic data and questions linked to menstrual cycle. These involved: age at menarche, regularity and duration of the cycle, the associated pain during menstruation and its severity, the use of analgesic, and the degree of relief in menstrual pain. School absenteeism and physical activity during the menstrual cycle were assessed. Further assessment included pain associated with defecation and urination during the menstrual cycle (**Appendix 1**).

Participants were asked to select between the options yes/no and to use a 1 - 10 Likert scale to grade the intensity of the menstrual pain. The scores were classified into mild (1 - 3), moderate (4 - 7), and severe (8 - 10) dysmenorrhea, using the Multi-dimensional Scoring system (MSS) grading of pain (**Appendix 2**).

The questionnaire took about 20 minutes or less to complete, followed by an endometriosis awareness lecture.

### 2.3. Data Analysis

Data were analysed using IBM-SPSS for windows, version 23.0 (SPSS Inc., Chi-

ago, IL). Descriptive statistics are presented as frequencies with percentages, bar chart, pie graphs, measure of central tendency and dispersion.

## 2.4. Ethical Approval

The study was approved by Dubai Research Scientific Ethical committee in Dubai Health Authority (Approval number: DSREC-03/2018\_17). The study protocol was approved by the Ministry of Education (MOE) and Knowledge and Human Authority (KHDA). Informed consent was obtained from all participants.

## 3. Results

456 girl students in grades 7 - 12, aged 11 - 19 had completed a self-administered questionnaire. The answers to the questions were analysed, as follow.

### 3.1. Participants Characteristics

Participant characteristics with their menstrual cycle characteristics were assessed using the responses given on the questionnaire (**Table 1**).

**Table 1.** Socio-demographic and menstrual characteristics of participants.

Variables	Number	Frequency or Percentage
<b>Age</b>		15.18 +/- 1.81 years
<b>Mean age of menarche</b>	456	12.23 +/- 1.25
<b>Nationality</b>		
Emirati	363	79.8%
Other	93	20.2%
<b>Mother Education</b>		
Illiterate	23	5.4%
Primary or high school	197	46%
Higher Diploma	16	3.7%
University +/- Post Graduate Qualification	192	44.8%
<b>Mother's occupation</b>		
Housewife	311	68.7%
Employee	142	33.3%
<b>Family History of severe Dysmenorrhea and/or Endometriosis</b>	218	47.9%
<b>Menstrual Cycle duration</b>		
4 days	49	10.8%
5 - 7 days	264	60.5%
>7 days	130	28.7%
<b>Severity of menstrual pain</b>		
Mild	105	23.1%
Moderate	117	33%
Severe	208	45%
<b>Perception of own period</b>		
Normal	313	71%
Abnormal	124	28%
Didn't Know	4	0.9%

Majority of our participants (79.8%) were natives. There was almost an equal percentage of participants' mothers with primary/high school degree and university degree, while majority of them were housewives (68.7%). Interestingly, nearly half the population (47.9%) had a family history of dysmenorrhea. A large percentage of the participants (60.5%) had clinically normal menstrual duration that ranged from 5 to 7 days. Dysmenorrhea was found in 94.7% of the total study population. A total of 208 participants (45%) reported severe pain during menstruation (**Figure 2**).

More than half of the participants (57.1%) did not use pain relieving medications such as paracetamol or NSAIDs for their menstrual cramps. Among the participants who used analgesia, surprisingly more than half (56.6%) reported no relief from pain, while a few (8.6%) with severe pain reported that they needed to go to the clinic or hospital for medical advice. None of the participants reported receiving hormonal treatment (**Figure 3(a)** & **Figure 3(b)**).

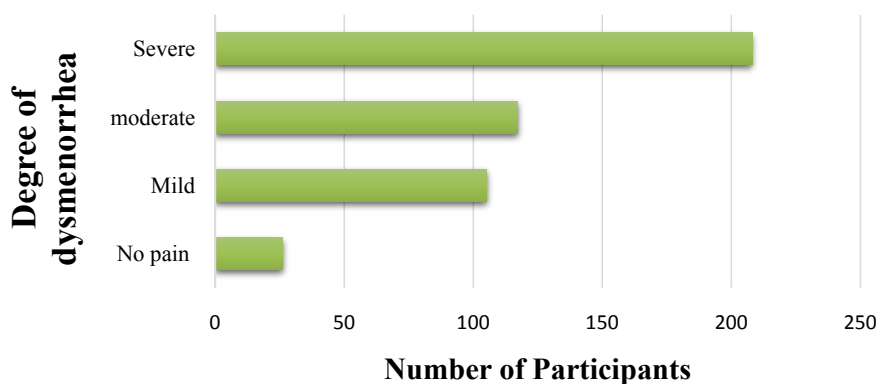
### 3.2. Effect of Dysmenorrhea on School Absenteeism and Hindrance to Physical activity

One fourth of the participants reported school absence with each menstrual cycle due to the severe pain associated with it; for the same reason, one third reported cessation of sport activities and missing training, which was frequent among those who were in the national team (**Figure 4**).

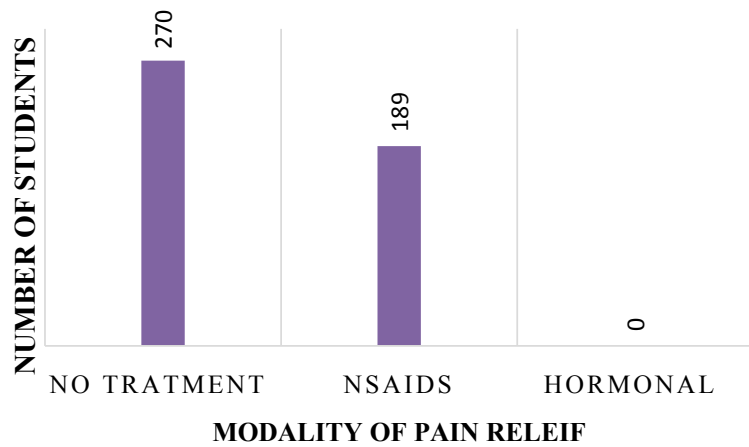
### 3.3. Exploring Possible Symptoms That Strongly Suggesting Deep Infiltrating Endometriosis (DIE)

Among the participants, 74 (16.3%) and 57 (12.5%) reported pain during defecation and while passing urine, respectively, during each menstrual cycle. Further, 64 (14.1%) students reported persistence of pain after the menstrual cycle (**Figure 5**).

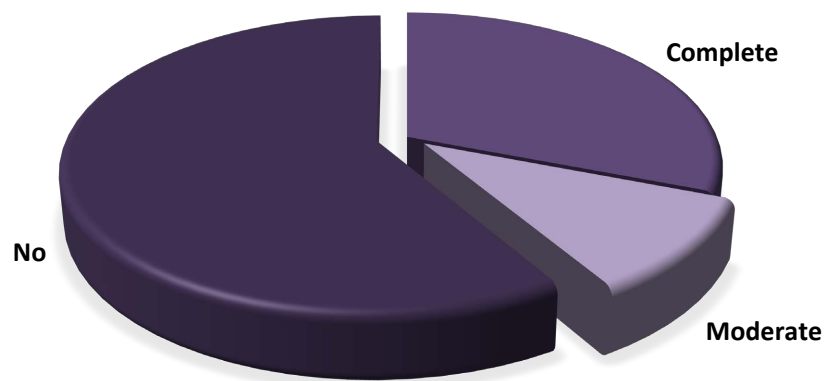
A total of 124 (28.1%) respondents have shown concern about their menstrual associated pain and were willing to follow up on future clinical assessments for their cases.



**Figure 2.** Menstrual Cycle Pain Grading on 1 - 10 Likert scale. This figure illustrates the severity of dysmenorrhea among participants.



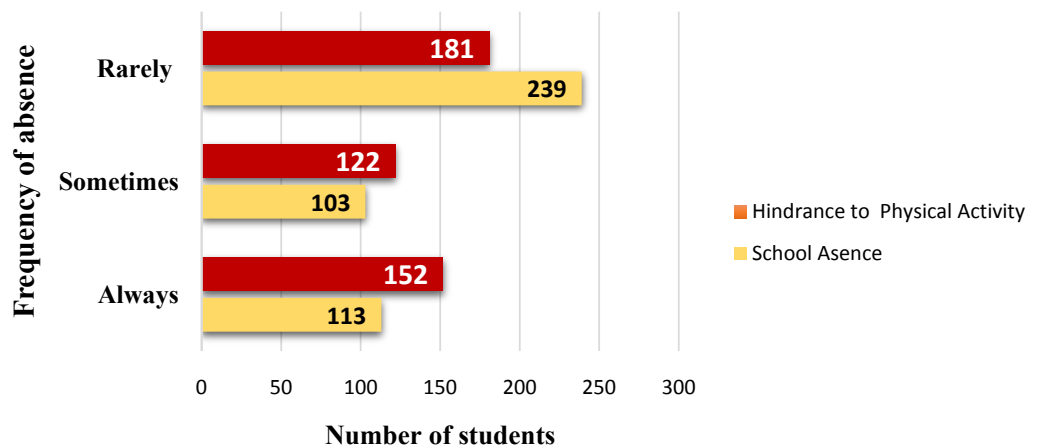
(a)



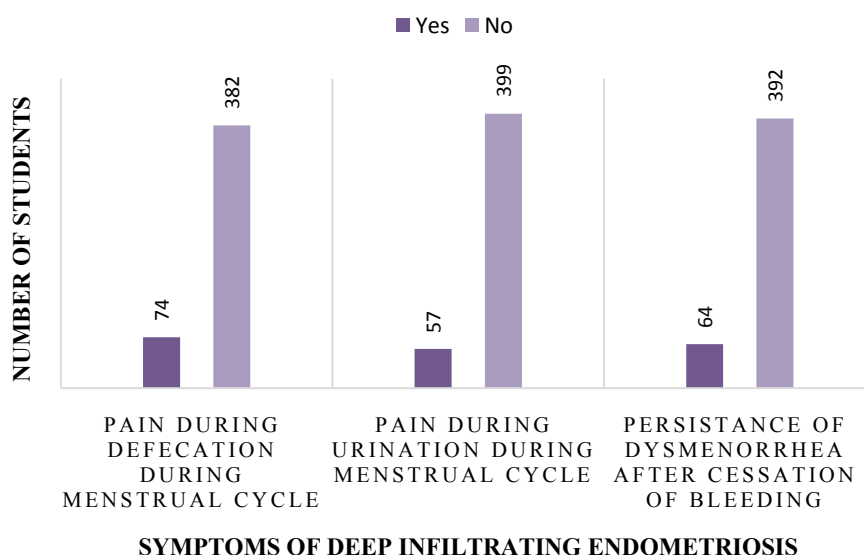
(b)

**Figure 3.** (a) Modalities of treatment used by participants. This figure illustrates modalities of pain relief adopted by participants. (b) Degree of Pain Relief. Illustrates the response of pain relief among participants used analgesia.

### Absence from school and Hindrance to physical activities during menstrual cycle.



**Figure 4.** Impact of dysmenorrhea on school absenteeism and hindrance to physical activity. Illustrates the effect of dysmenorrhea on school attendance and physical activities.



**Figure 5.** Co-existence of symptoms suggestive of deep infiltrating endometriosis. Illustrates the presence of symptoms suggestive of deep infiltrating endometriosis among participants.

#### 4. Discussion

The menstrual cycle is a physiological process that declares the potential capability of reproduction. Mild dysmenorrhea is common and expected, however moderate to severe dysmenorrhea is disabling. The problem of persistent dysmenorrhea is more pronounced in adolescents where the negative impact associated with pain can reflect on their academic and physical performance [4].

The aim of our study was to detect the prevalence of dysmenorrhea among adolescents in Dubai. Therefore, this cross-sectional study was conducted with appreciably high response rate.

Interestingly 218 students mentioned a family history of dysmenorrhea.

Among the 456 students who submitted their responses, we have demonstrated a prevalence of dysmenorrhea in 430 participants, (94.7%), with variable severity (mild = 23.1%, moderate = 33%, and severe = 45%).

This was the highest rate among other studies conducted in the gulf and other Arab countries.

In Saudi Arabia, two studies revealed a prevalence of 70.6% (n = 197); severe (35.2%) and 74.4% (n = 256; mild = 21.1%, moderate = 41.4%, and severe = 37.5%) [20] [21]. In Kuwait, a study conducted by AL Matouq *et al.* [22] demonstrated a prevalence of 85.6% (n = 763). Another study in Egypt by Kamel *et al.* [12] reported a prevalence of 84% (269) among university students.

The severity of menstrual pain reported in our study (45%), was higher than that reported in Saudi Arabia at the King Abdul-Aziz University, which was 29% [23], and that in Lebanon, which was 20% [24].

Several studies revealed a positive correlation between the severity of menstrual pain and school absenteeism; we found that 24.8% of participants missed their academic classes during the menstruation since they could not cope with the se-



verity of the menstrual pain. Higher rates of 59.4% and 58.2% was reported by Abd El Mawgood *et al.* [21] and Al Matouq *et al.*, [22] respectively.

A lower rate was however reported by Kamel *et al.*, [12] where 16.8% of the students missed their classes.

Al Asadi and Abdul Qadir [25] revealed that dysmenorrhea affects concentration and distracts student's attention, leading subsequently to poor academic performance.

In the current study 152 participants (33%) declared complete cessation of their regular training and physical activities during the menstrual period due to painful cramps. This matches approximately to Kamel *et al.*, findings (39.5%) [12].

Our study was unique in exploring symptoms that are strongly linked with endometriosis, which were painful micturition and defecation during the menstrual cycle. Painful micturition was reported by 43.1% of participants, which was really alarming since it could be a symptom for an underlying deep infiltrating endometriosis [26].

The other symptom that strongly related to endometriosis was painful defecation during the menstrual cycle and was reported by 46.7% of the participants with varying degrees. Recently Chapron *et al.* [27] identified this as an independent predictor for DIE, with 74.5% sensitivity and 68.8% specificity [28].

NSAIDS is the first option for managing menstrual pain. To maximize its effectiveness, it should be taken 1 - 2 days before the onset of menses, to block prostaglandin synthesis by interrupting the action of cyclooxygenase enzyme [28].

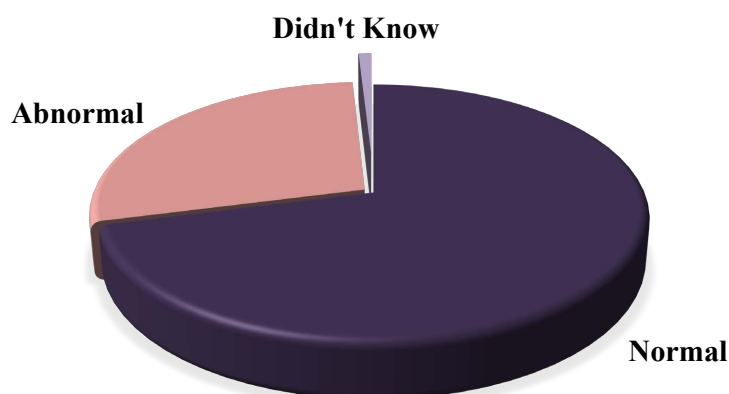
Failure to respond to NSAIDS may be due to the delay in starting dosage, or insufficient dose. This could be the reason for the high failure rate among the participants in the study. Adolescents with persistent dysmenorrhea should have an extensive evaluation to establish an underlying pathological element [29].

A study by Kamel *et al.* [12] demonstrated high pain relief rate among the participants (87.2%) after using NSAIDS. This could be related to the age of the participants, since they were college students with a mean age of  $20.4 \pm 1.7$  years.

Although hormonal therapy is recognized as an effective tool in treating dysmenorrhea worldwide, it is not widely accepted as a modality of treatment for adolescents in our community.

The American College of Obstetricians and Gynaecologists, in its committee opinion no. 760 reported that a positive family history of endometriosis in first-degree relative poses a 7 to 10-fold increase in the risk of developing endometriosis. The percentage reported in our study (47.9%) requires further evaluation [6].

Irrespective of the high rate of dysmenorrhea among participants, majority considered this pain to be a normal part of the menstrual cycle (**Figure 6**) [23]. This could be related to the cultural beliefs and rituals, which influence the interpretation of menstrual pain.



**Figure 6.** Own perception of severe dysmenorrhea. Illustrates the perception of severe dysmenorrhea by participants.

Knowing this fact, we conducted an awareness presentation for all participants from different schools, with the aim of rectifying their knowledge on menstrual pain [14].

Therefore, further surveys among female adolescents using approved screening tools should be encouraged with the aim of early recognition and treatment of endometriosis in adolescence.

Such implementation will have a tangible impact on the pathological progress of the disease and help avoid its negative effect on female fertility, hence improving the quality of life of these adolescents. It will also help in increasing awareness among those young population [14].

The study is the first to provide information about the actual existence of dysmenorrhea in Dubai, UAE; thus, we believe it will help physicians to plan and develop strategies for improving reproductive health among this group.

In addition, it was unique in exploring symptoms that suggest endometriosis, therefore it supports moving the diagnosis of endometriosis from surgical to clinical to enhance early diagnosis and prevent grave sequelae [30].

Our study had few limitations related to the use of a self-reported questionnaire. Moreover, it is a single-centre study, conducted in Dubai, which doesn't represent the whole UAE.

## 5. Recommendations

We believe that our study can pave the way for future investigations on a nation-wide scale to investigate the impact of the disease on the quality of life in adolescents. Future nation-wide surveys are needed to accumulate more data on the prevalence of primary dysmenorrhea among schoolgirls and its impact on their social life and physical wellbeing. This data will help formulate baseline information for future researches in endometriosis among adolescent girls in Dubai and other parts of emirates. The cohort of adolescents that presented with symptoms suggestive of endometriosis will require further follow up and clinical evaluations to prevent potential long-term morbidities. It is imperative that ap-

appropriate action be taken to educate and provide health services to avoid future impediment to fertility and/or surgical intervention and to prevent central sensitization on those patients.

Based on the results of this survey, awareness on endometriosis and lifestyle modifications were recommended for the study group through educational presentations and follow up meetings.

Further, educating mothers will have a positive impact on disease progression through early recognition and prompt medical consultation with specialists where needed.

Moving the diagnosis of endometriosis from surgical to clinical will undoubtedly shorten the long journey of diagnosing such debilitating disease among adolescents.

## Conclusion

Severe dysmenorrhea in Dubai is a crucial problem, and data obtained could reveal endometriosis as a secondary cause.

## Advances in Knowledge

This study found a surprisingly high prevalence of dysmenorrhea among female adolescents in Dubai.

## Application to Patient Care

This study calls for screening to identify young women who are strongly suspected to have endometriosis in order to alleviate their severe menstrual pain and improve their quality of life, thus reducing school absenteeism, which will have a positive impact on their academic achievement.

## Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

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## Appendix

1) The study questionnaire.

# COMMUNITY SURVEY

**Painful period is a very common symptom, However, sever pain is not, this study designed to assess which category you fall under and guide you further.**

قد تصاحب الدورة الشهرية آلام تتراوح بين البسيطة والشديدة، هذا الإستبيان لمساعدتك و تقديم الخدمة المناسبة لك



## Study on how Painful your Period Is

### دراسة حول الآلام المصاحبة للدورة الشهرية

This study is being conducted to assess the setbacks due the pain during period in high school and college students,

هذه الدراسة صممت لتحديد الآثار المصاحبة للدورة الشهرية و تأثيرها على طالبات الثانوية و الجامعة.

Your participation is voluntary and your data is confidential.

هذه الدراسة اختيارية وجميع المعلومات تعامل بسرية تامة.

Please answer the following questions before starting the questionnaire,

رجاء الإجابة على جميع الأسئلة أدناه

#### (A) Basic Information: معلومات عامة

1. How old are you? السن

-----

2. When did you get your first period? سن البلوغ

-----

3. How many days is your period? ما هي مدة مكوث الدورة الشهرية

a) <4 days

b) 5-7days

c) >7days

4. What is your nationality? (This information required for any medical research)

ما هي جنسيتك؟ (هذه المعلومة مهمة للأبحاث الطبية)

a) UAE national.

b) Expatriate.

**6. Mother Age: سن الأم:**

- a) 25-30 years
- b) 31-35 years
- c) 36-40 years
- d) >40 years

**7. Mother Education: المستوى التعليمي للأم**

- a) can't read or write لا تقرأ ولا تكتب
- b) Primary School. المرحلة الابتدائية
- c) Secondary School المرحلة الثانوية
- d) Diploma دبلوما
- e) University جامعية
- f) Master ماجستير
- g) PHD دكتوراه

**8. Mother Occupation: عمل الأم**

- a) House wife ربة منزل
- b) Employee, please mention the job----- موظفة



3. I have pain before period.

أعاني من آلام قبل الدورة

Yes No

4.I have pain after the period

أعاني من آلام بعد انتهاء الدورة

Yes No

4.I have a similar problem in my family

هناك في عائلتي من لديهن نفس المشكلة

Yes No

5.I heard about endometriosis.

سمعت عن مرض بطانة الرحم المهاجرة

Yes No

6.I need help

أحتاج للمساعدة

Yes No

7.1 I use hormone tablets

استخدم دواء هرموني

Yes No

**( C ) For the next several questions, please choose a number from 0-10 with 0 indicating not at all and 10 indicating too much and write it next to each statement ,**

لأسئلة التالية الرجاء الإجابة برقم من 0-10، حيث 0 تعني لا يوجد أبداً و10 تعني يوجد بكثرة

0	1	2	3	4	5	6	7	8	9	10
Not at all										Too much

1. My period is painful. دورتي مؤلمة

0	1	2	3	4	5	6	7	8	9	10
Not at all										Too much

2.I have to use pain tablets during my period لا بد من استخدام المسكنات أثناء الدورة

0	1	2	3	4	5	6	7	8	9	10
Not at all										Too much

3.I got relieved when I use pain tablets أشعر بالتحسن بعد استخدام المسكنات

0	1	2	3	4	5	6	7	8	9	10
Not at all										Too much

4.I need to go to the Clinic/Hospital for Pain Injections.

أحتاج للذهاب إلى المركز الصحي أو المستشفى لأخذ حقنة مسكنة

0	1	2	3	4	5	6	7	8	9	10
Not at all										Too much

5. I stop exercising and sports during my period.

## 8.I experience pain when I urinate during my period.

أشعر بالألم مصاحبة للتبول أثناء الدورة										
0	1	2	3	4	5	6	7	8	9	10
Not at all										Too much

**(D) Consultation with a doctor, this part to be filled by your parent**

(1) If the pain score represents moderate to severe degree, then your child is among high-risk population to have endometriosis. Therefore, will you agree to consult with a gynecologist?

YES NO

(2) If the pain is non-responsive to any pain tablet for more than 3 months, then your child is among high-risk population to have endometriosis. Therefore, will you agree to consult with a gynecologist?

YES NO

(3) If your child is among the low-risk population we will not contact you.

*If your child is among the high-risk population you need to consult with a gynecological doctor for proper diagnosis and management.*

*In such a case we want to contact you. Do you mind to write your full name or mobile number? Thank you for your kind cooperation.*

*لا تتردد في طلب المساعدة، سجلي اسمك ورقم التواصل لتقديم الخدمة المناسبة لك*

*Full Name:-----*

*Mobile number:-----*

## 2) Multi-dimensional Scoring system (MSS) grading of pain.

<b>Grade</b>	<b>Description</b>
0	Menstruation is not painful and daily activity is unaffected.
1 (Mild)	Menstruation is painful but seldom inhibits normal activity; analgesics are seldom required; mild pain.
2 (Moderate)	Daily activity is affected; analgesics required and give sufficient relief so that absence from school is unusual; moderate pain.
3 (Severe)	Activity clearly inhibited; poor effect of analgesics; vegetative symptoms (headache, fatigue, vomiting, and diarrhea); severe pain.