Dysmenorrhea among female medical students in King Abdulaziz University: Prevalence, Predictors and outcome

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ABSTRACT
Objective: To determine the prevalence, predictors and outcome of dysmenorrhea among female medical students in King Abdulaziz University (KAU), Jeddah, Saudi Arabia.

Methods: A cross-sectional study was conducted among 435 medical students at KAU, Jeddah selected through stratified random sample method. A pre-constructed, validated, self-administered questionnaire was used to collect personal and socio-demographic information. Data about menstrual history, stress, smoking were also collected. The severity of dysmenorrhea was scored by the “Visual Analogue Scale (VAS)”. Descriptive and analytical statistics were conducted.

Results: The prevalence of dysmenorrhea was 60.9%. Logistic regression showed that heavy period was the first predictor of dysmenorrhea (aOR=1.94; 95% CI: 1.29- 2.91), followed by stress (aOR=1.90; 95% C.I.: 1.19-3.07). The prevalence of severe dysmenorrhea among the sufferers was 38.6%. Depressed mood was the commonest (80.8%) symptom accompanying dysmenorrhea. Regarding the outcome of dysmenorrhea, 67.5% of the sufferers reported emotional instability, while 28.3% reported absenteeism from the university.

Conclusions: A high prevalence of dysmenorrhea was prevalent among medical students in King Abdulaziz University (KAU), Health promotion, screening programs, and stress management courses are recommended.

KEY WORDS: Dysmenorrhea, Prevalence, Predictors, Outcome and Visual Analogue Scale.

INTRODUCTION

Menstrual disorder is an important health problem among females during their reproductive age.1 Dysmenorrhea is defined as a cramping pain that is located in the lower abdomen. It may be associated with headache, dizziness, diarrhea, nausea and vomiting, backache and leg pain.2 It is one of the commonest complaints and abnormality among females at their reproductive age.3,4 It was estimated that about 25-95% of females are complaining from dysmenorrheal.5-7 It is also associated with greater psychological, physical, behavioral and social distresses.5
Dysmenorrhea among female medical students

quality of life. Despite its high prevalence and the associated negative effects, many women do not seek medical care for this condition.6

A cross-sectional study conducted among medical sciences students from Nigeria, 2012, found that the prevalence of dysmenorrhea was very high among the medical students and it is related to obesity, socioeconomic level, exercise and dietary habits. They also reported that changes in menstrual pattern may affect their physical and mental health.8 Although dysmenorrhea represents a big public health problem among females, however, few studies have been conducted about this important problem among medical students in Jeddah.

The objective of the study was to determine the prevalence, predictors and outcome of dysmenorrhea among female medical students in King Abdulaziz University, Jeddah, Saudi Arabia.

METHODS

This cross-sectional study was conducted at King Abdulaziz University (KAU), Jeddah after administrative approvals. The study population included female medical students who had completed the freshman year (2nd – 6th), during the academic year 2013-2014. A stratified random sample method was used; taking into consideration student’s grade. The sample size was calculated by the following formula:

\[ n = \left( \frac{Z^2 \times p \times q}{d^2} \right) \]

\( n \) = the minimum sample size, \( Z \) = 1.96. The prevalence of dysmenorrhea was assumed to be 35%.99 So, \( p = 0.35 \) and \( q = 1 - p = 0.65 \). The minimum calculated sample size with 5% error and 95% confidence interval = 350. For stratification purposes, the sample size was increased to reach 435 during the fieldwork.

A pre-designed, anonymous, self-administered questionnaire was used. Face and content validity were evaluated by two experts. Reliability was assessed with Cronbach’s \( \alpha \) and was found to be 0.83. The questionnaire asked about personal, socio-demographic information and family history of dysmenorrhea. Menstrual history of amenorrhea, amount of blood loss (the number of changed towels/ day during menses), and premenstrual symptoms were also asked. Dysmenorrhea was determined by the “presence of two or more days of menstrual pain during menstrual bleeding”. If there was dysmenorrhea, females were asked about the location(s) of pain.2 The questionnaire included the “Visual Analog Scale for pain (VAS)” which is measured on 10 cm scale that representing no pain at one end (0) and the severest imaginable pain written at the other end (10).10

Data analysis: Data was analyzed using SPSS, version 21. According to VAS, there are three ranges of pain: 1–4 for mild pain, 5–6 for moderate pain, and 7–10 for severe pain.10

Chi-squared/ Fisher’s exact test, odds Ratios (ORs) and 95% Confidence Interval (CI) were calculated. A logistic regression model was performed to detect the predictors of dysmenorrhea after controlling for confounding factors. Significance was considered at \( p < 0.05 \).

Ethical approval was obtained from the Institutional Review Board (IRB) of the Faculty of Medicine, KAU (Reference Number: 134-15) and conformed to the ethical standards of the Helsinki Declaration.

RESULTS

The study enrolled 435 female medical students with a mean of 21.40 ±1.4 years. The majority of them were single (94.5%), living with their families (88%). The prevalence of premenstrual symptoms, irregular periods, and secondary amenorrhea were 82.3%, 22.8% and 0.9%, respectively.

The prevalence of dysmenorrhea among medical students was 60.9%, but only 3.2% asked for medical advice. Among the students suffered from dysmenorrhea, 30.6%, 30.8% and 38.6% suffered from mild, moderate and severe pain, respectively. Furthermore, the prevalence of severe dysmenorrhea among the whole female sample was 29.0%.

The prevalence of dysmenorrhea was significantly higher among students enrolled in the basic years compared to those in the clinical years (OR= 1.52; 95% CI: 1.03 -2.65). Table-I. The rate of dysmenorrhea was higher among students with non- enough family income compared to others (\( p < 0.05 \)).

Students who had stress suffered from dysmenorrhea (64.3%) more than the others (48.3%). Table-II. A highly statistical significant difference was present (\( X^2 = 7.80, p < 0.01 \)). Furthermore, the prevalence of dysmenorrhea was significantly higher among students who had family history of dysmenorrhoea. Females who complained from heavy periods (> 3 towels/ day) were about 2 times (OR=1.90; 95% CI: 1.27-2.83) more prone to develop dysmenorrhea compared to others. Smokers and those who didn’t practice physical activity had higher prevalence of dysmenorrhea compared to others. However,
no statistical significance differences were found
\((p>0.05)\).

After controlling confounding factors in the logistic regression model, heavy period was the first predictor of dysmenorrhea \((\text{aOR}=1.94; 95\% \text{ CI}: 1.29-2.91)\), followed by presence of stress \((\text{aOR}=1.90; 95\% \text{ C.I.:} 1.19-3.07)\). Table-III.

Depressed mood was the commonest \((80.8\%)\) symptom accompanying dysmenorrhea, followed by anger \((78.5\%)\). Table-IV. Eating more than usual \((46.0\%)\), headache \((45.7\%)\), nausea \((42.3\%)\), dizziness \((38.1\%)\), diarrhea \((33.6\%)\) and constipation \((22.3\%)\) were the main symptoms.

The different outcomes of dysmenorrhea among the complainers are shown in Table-V.. Emotional instability was the commonest \((67.5\%)\) outcome of dysmenorrhea, followed by limited daily activity \((54.7\%)\), sleep disturbance \((54.0\%)\), reduced concentration \((50.9\%)\), decreased social activities \((50.6\%)\) and absenteeism from university \((28.3\%)\).

### DISCUSSION

In this study the prevalence of dysmenorrhea was 60.9\%, which is slightly higher than the rate reported from Turkey \((55.5\%)\).\(^{11}\) On the other hand, there is a big global variation in the prevalence of the dysmenorrhea. It was found to be 72.4\% among university students from India,\(^{5}\) 70\% from Italy,\(^{12}\) 80\% among females aged 15–17-year-old from Australia.\(^{13}\) These variations may be due to differences between the target populations, lifestyle, or due absence of a standardized universally accepted method for defining dysmenorrhea.\(^{13,14}\)

It was reported that 21.7\% of the Iranian women aged 16 - 56 years suffered from severe pain. The current study reported a higher prevalence by VAS \((29.0\% \text{ among the total sample, and } 38.6\% \text{ among the sufferers from dysmenorrhea})\). The causes of discrepancies may be attributed to younger age of participants in the current study or due to different used scales.\(^{15}\)
In the current study heavy period was the first predictor of dysmenorrhea. Similarly a study from Athens, Greece, found that there was a good correlation between heavy and painful periods. Stress was one of the predictors of dysmenorrhea in the current study, after controlling confounding. Similar results were reported by other studies. Several studies give an explanation for this association by relating stress with the cascade of neuro-endocrine responses. Dorn, et al. reported that emotional disturbance may cause menstrual cycle abnormalities, especially dysmenorrhea which agrees with our results. A statistical association was found between family history of dysmenorrhea and dysmenorrhea among female medical students.

<table>
<thead>
<tr>
<th>Variable</th>
<th>Yes</th>
<th>No</th>
<th>X²</th>
<th>P</th>
<th>OR</th>
<th>95% CI</th>
</tr>
</thead>
<tbody>
<tr>
<td>Smoking*</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>8</td>
<td>2</td>
<td>1.56*</td>
<td>0.21</td>
<td>2.62</td>
<td>0.55-12.46</td>
</tr>
<tr>
<td>No</td>
<td>257</td>
<td>168</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Practice physical exercise</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>95</td>
<td>71</td>
<td>1.54</td>
<td>0.21</td>
<td>0.78</td>
<td>0.53-1.16</td>
</tr>
<tr>
<td>No</td>
<td>170</td>
<td>99</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Stress</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>220</td>
<td>122</td>
<td>7.80</td>
<td>0.005</td>
<td>1.92</td>
<td>1.21-3.06</td>
</tr>
<tr>
<td>No</td>
<td>45</td>
<td>48</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Age of menarche</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>≥15</td>
<td>26</td>
<td>23</td>
<td>1.43</td>
<td>0.23</td>
<td>0.70</td>
<td>0.38-1.26</td>
</tr>
<tr>
<td>&lt;15</td>
<td>239</td>
<td>147</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Duration between menstrual cycle</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>≤35</td>
<td>235</td>
<td>158</td>
<td>2.16</td>
<td>0.14</td>
<td>0.60</td>
<td>0.30-1.20</td>
</tr>
<tr>
<td>&gt;35</td>
<td>30</td>
<td>12</td>
<td></td>
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</tr>
<tr>
<td>Duration of bleeding</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>≤5 days</td>
<td>53</td>
<td>46</td>
<td>2.93</td>
<td>0.08</td>
<td>0.67</td>
<td>0.43-1.06</td>
</tr>
<tr>
<td>&gt;5 days</td>
<td>212</td>
<td>212</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Amount of bleeding</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&gt;3 towels/ day</td>
<td>128</td>
<td>56</td>
<td>10.01</td>
<td>0.002</td>
<td>1.90</td>
<td>1.27-2.83</td>
</tr>
<tr>
<td>≤3 towels/ day</td>
<td>56</td>
<td>37</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>BMI*</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Normal weight</td>
<td>190</td>
<td>113</td>
<td>0.354</td>
<td>0.84</td>
<td>1.12</td>
<td>0.70-1.81</td>
</tr>
<tr>
<td>Over &amp; obese</td>
<td>56</td>
<td>37</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Family history of dysmenorrhea</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>124</td>
<td>62</td>
<td>4.51</td>
<td>0.03</td>
<td>1.532</td>
<td>1.03-2.27</td>
</tr>
<tr>
<td>No</td>
<td>141</td>
<td>108</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

* N.B. 37 cases didn’t report her weight and / or height
*Fisher’s exacts test.

Table-III: Logistic regression analysis of predictors of dysmenorrhea among medical students in King Abdulaziz University.

<table>
<thead>
<tr>
<th>Predictor</th>
<th>B</th>
<th>Sig.</th>
<th>aOR</th>
<th>95% C.I.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Heavy period</td>
<td>0.663</td>
<td>0.001</td>
<td>1.94</td>
<td>1.29-2.91</td>
</tr>
<tr>
<td>Stress</td>
<td>0.647</td>
<td>0.007</td>
<td>1.90</td>
<td>1.19-3.07</td>
</tr>
<tr>
<td>Constant</td>
<td>-2.883</td>
<td>0.000</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

aOR: “Adjusted Odds Ratio” C.I.: “Confidence Interval”

Table-IV: Symptoms accompanying dysmenorrhea among female medical students in King Abdulaziz University.

<table>
<thead>
<tr>
<th>Symptoms</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Depressed mood</td>
<td>80.8</td>
</tr>
<tr>
<td>Anger</td>
<td>78.5</td>
</tr>
<tr>
<td>Eating more than usual</td>
<td>46.0</td>
</tr>
<tr>
<td>Headache</td>
<td>45.7</td>
</tr>
<tr>
<td>Nausea</td>
<td>42.3</td>
</tr>
<tr>
<td>Dizziness</td>
<td>38.1</td>
</tr>
<tr>
<td>Diarrhea</td>
<td>33.6</td>
</tr>
<tr>
<td>Constipation</td>
<td>22.3</td>
</tr>
<tr>
<td>Vomiting</td>
<td>18.5</td>
</tr>
<tr>
<td>Phobia</td>
<td>14.7</td>
</tr>
<tr>
<td>Syncope</td>
<td>5.7</td>
</tr>
</tbody>
</table>

NB: Every question was separately asked.
which agrees with results of an older study of
absenteeism due to dysmenorrhea was 28.3%, our study. Furthermore, our study showed the rate
of girls suffered from it which agrees with results of
the activities of 53% of young Western Australian
from Turkey11 and this may be because the rate
of smoking among females in the current study is
lower than that from Turkey.

Our study showed that there is no association
between BMI and dysmenorrhea which disagrees
with other studies.16 (12) This discrepancy may be
due to differences between the study populations.
Results of the present study found that there
is no association between age of menarche and
dysmenorrhea, which concurs with the results from
Dammam.9 However, these results disagree with
results from Egypt.2

The prevalence of premenstrual symptoms was
82.3% in the current study, which coincides with
studies from Jordan18 and Spain.19 On the other
hand, Tabassum, et al.20 from Pakistan reported a
lower rate (53%).

As regards the outcomes of dysmenorrhea,
Hillen, et al.13 found that dysmenorrhea limited
the activities of 53% of young Western Australian
girls suffered from it which agrees with results of
our study. Furthermore, our study showed the rate
of absenteeism due to dysmenorrhea was 28.3%,
which agrees with results of an older study of
Bergsjo, et al.21 On the other hand, this rate is much
lower than the rate reported among adolescent girls
in USA,22 which may be attributed to the differences
between the two target populations.

Only 3.2% of students in the current study sought
medical advice for dysmenorrhea which is much
lower than the rate reported from Australia (18%)
(21). This may be because females in the current
study may believe that the painful periods are
normal with no need to seek medical advice, or may
be because of their shyness to go to gynecologist.

CONCLUSIONS

A high prevalence of dysmenorrhea was prevalent
from the current study. The main predictors were
heavy peoid and stress. This problem requires
attention through conduction of health promotion
and screening programs. Stress management
courses for minimizing possible consequences
and outcomes of dysmenorrhea among medical
students.

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students at a university in Turkey. Int J Gynaecol Obstet.

<table>
<thead>
<tr>
<th>Symptoms</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Emotional instability</td>
<td>67.5</td>
</tr>
<tr>
<td>Limited daily activity</td>
<td>54.7</td>
</tr>
<tr>
<td>Sleep disturbance</td>
<td>54.0</td>
</tr>
<tr>
<td>Reduced concentration</td>
<td>50.9</td>
</tr>
<tr>
<td>Decreased social activities</td>
<td>50.6</td>
</tr>
<tr>
<td>Absenteeism from university</td>
<td>28.3</td>
</tr>
</tbody>
</table>

NB: Every question was separately asked.

Table-V: Outcomes of dysmenorrhea reported by female medical students in King Abdulaziz University.
Dysmenorrhea among female medical students


Authors’ Contributions:

NKI: designed the study, did the statistical analysis, writing & editing of the manuscript. Takes the responsibility of the work, reviewed and gave the final approval of manuscript.

MSA, ANA, FAA, HAA, AKA & RAA: were involved in data collection, data entry, data analysis and helped in manuscript writing.