RELATED FACTORS AND CONSEQUENCES OF MENSTRUAL DISTRESS IN ADOLESCENT GIRLS WITH DYSMENORRHEA

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This study investigated symptoms, related factors, and consequences of menstrual distress in adolescent girls with dysmenorrhea. A total of 198 participants were recruited by convenience sampling from a technical college in Tainan County, Taiwan. Four instruments were used to collect data: a Demographic Data Questionnaire, a Menstrual Distress Questionnaire, the Short Form McGill Pain Questionnaire, and an Adolescent Menstrual Attitude Questionnaire. The top five symptoms of menstrual distress were cramps, fatigue, backache, swollen abdomen, and tender breasts. Results of stepwise multiple regression indicated that the best subsets for predicting adolescent menstrual distress, including age, mother’s occupation, menstrual pain, and menstrual attitude, accounted for 59% of total variance. From the correlation analysis, the more severe the menstrual distress, the higher the impact on daily activities as well as the more frequent the absence from class and analgesic usage. The results of this study may provide a useful reference for school nurses designing menstrual health programs for adolescents.

Key Words: adolescent girls, menstrual distress

Menstrual distress symptoms include pain, water retention, autonomic reactions, mental distress, impaired concentration, behavior change, and arousal [1,2]. Dysmenorrhea is the most familiar menstrual distress syndrome and one of the most common gynecologic problems in women of all ages [3,4]. An estimated 10% of women who experience dysmenorrhea have pain severe enough to interfere with their functioning for 1–3 days a month [5]. Although some women experience discomfort several hours before the onset of flow, symptoms usually begin with menstruation. Symptoms of dysmenorrhea may last several hours or several days. Pain is usually located in the suprapubic area or lower abdomen. Women commonly describe the pain as either sharp, cramping, gripping, or as a steady dull ache. Pain may radiate to the lower back or upper thighs [4]. Primary dysmenorrhea, a condition associated with ovulatory cycles, is due to myometrial contractions induced by prostaglandins in the second half of the menstrual cycle. The uterine muscle of both normal and dysmenorrheic women is sensitive to prostaglandins, and the amount of prostaglandin produced is the major differentiating factor [6]. Systemic responses to prostaglandin F2α (PGF2α) include vomiting, fatigue, backache, weakness, sweating, gastrointestinal symptoms, and central nervous system symptoms [4,7–9]. Most prostaglandins are released during the first 48 hours of menstruation, which coincides with the greatest intensity of symptoms [7,8]. About 92% of Chinese women surveyed in a Hong Kong study reported menstrual symptoms including pain, fatigue, water retention, and mental distress. Among the menstrual symptoms, fatigue was the most prevalent symptom; pain, water retention, behavioral changes, and mental distress were experienced by more than 64% of respondents [10].

Subjects suffering from dysmenorrhea are more susceptible to psychologic disorders such as depression, anxiety, and somatization [11]. Alonso and Coe studied 184 young women with dysmenorrhea and reported that depression and anxiety were strongly associated with menstrual pain...
Menstrual symptomatology, and with sources of information to menstruation with the attitudes of their mothers, with attempted to correlate adolescents' attitudes or "adjustment"

Researchers investigating adolescent menstruation have reported them as less severe than pessimistic women. Capable of overcoming dysmenorrheal symptoms and, thus, the desire for concealment stems from its embarrassing nature menstruation both symbolically and materially and this is thought of as dirty or bad [16]. It is reported that women who express disgust about menstruation and have a more traditional view of the female role in society have greater menstrual distress than those with more positive views [17]. Kissling found that American adolescent girls conceal menstruation both symbolically and materially and this desire for concealment stems from its embarrassing nature [18]. In a similar fashion, optimistic women may be more capable of overcoming dysmenorrheal symptoms and, thus, report them as less severe than pessimistic women. Researchers investigating adolescent menstruation have attempted to correlate adolescents' attitudes or "adjustment" to menstruation with the attitudes of their mothers, with menstrual symptomatology, and with sources of information [19,20].

Dysmenorrhea is the leading cause of school and work absence in young women [11]. In a study by Banikarim et al, menstrual pain was significantly associated with school absenteeism and decreased academic performance, sports participation, and socialization with peers [9]. Among adolescents and young adults, 51–54% of those experiencing menstrual discomfort reported being absent from school or work because of the discomfort [21]. Links have been made between high levels of prostaglandins, especially PGF2α, and menstrual discomfort; women with primary dysmenorrhea have higher levels of prostaglandins than women who do not have dysmenorrhea [22]. In addition to psychologic factors such as lack of adequate social support, factors associated with high levels of menstrual discomfort are poor physical health, tobacco and alcohol consumption, high levels of stress, inadequate or incorrect knowledge of menstruation prior to menarche [3,8,12] and, less often, severe dysmenorrhea [3,23].

Recent literature suggests that cultural beliefs regarding menstruation have a major effect on the reporting of menstrual symptoms. Such beliefs seem likely to affect women’s attitudes and expectations regarding the menstrual experience. Related factors of menstrual distress need to be verified in Eastern culture. The purpose of this study was to determine the significant factors related to menstrual distress in Taiwanese adolescent girls.

**Materials and Methods**

**Subjects**

Convenience sampling provided 198 junior female student subjects with self-reported primary dysmenorrhea from a medical technology college in the Tainan area. Criteria for inclusion in the sample were: age less than 20 years, dysmenorrhea in the last three periods with an average score higher than five on the Visual-Analog Scale for Pain (VASP), and no history of gynecologic disease.

**Instruments**

Four instruments were used to collect data: a Demographic Data Questionnaire, a Menstrual Distress Questionnaire (MDQ), the Short Form McGill Pain Questionnaire (MPQ-SF), and an Adolescent Menstrual Attitude Questionnaire (AMQAQ). Content validity for these tools was established by four experts in the field of women's health. The internal consistency (Cronbach's coefficient) was tested.

Characteristics of adolescent girls were investigated using the Demographic Data Questionnaire. These included age, onset of menarche, duration of menstruation, frequency of menstruation, socioeconomic status, mother's occupation, impact on daily activity, absence from class, and respondent's use of analgesics.

The MDQ requires subjects to rate their symptoms using a four-point scale (1–4) ranging from "no experience of symptoms" to "present severe" over 47 items. The eight subscales of the MDQ are pain, water retention, autonomic reaction, negative affect, impaired concentration, behavior change, arousal, and control. The psychometric reliability of the MDQ has been established in English-speaking populations with moderate-to-high internal consistencies and intercorrelations. Being sensitive to individual variability in menstrual cycle experience, the MDQ scales have an acceptable internal consistency and intercycle stability [2,24]. The MDQ Short Form (MDQ-SF), comprising 16 items from the full scale, was translated into Chinese and used in the Chinese adolescent population. The 16 symptoms were grouped into three categories: pain, autonomic reactions, and water retention. Participants were asked to
report the symptoms they experienced during their most recent menstrual period using a rating scale ranging from 1 (no experience of the symptom) to 4 (severe or partially disabling symptoms). In this study, the MDQ-SF had adequate internal consistency (Cronbach’s α, 0.87).

The MPQ-SF was developed for use in specific research settings when the available time to obtain information from patients is limited and when more information is desired than that provided by intensity measures [25]. The MPQ-SF consists of 15 representative words from the sensory (n = 11) and affective (n = 4) categories of the standard long-form MPQ. The 15 descriptors comprising the MPQ-SF were selected on the basis of their frequency of endorsement by patients with acute, intermittent, or chronic pain. Each descriptor was ranked by subjects on an intensity scale of 0 (none), 1 (mild), 2 (moderate), and 3 (severe). In this study, the MPQ-SF had a high internal consistency (Cronbach’s α, 0.91).

The AMAQ consists of six subscales: positive feelings (12 items), negative feelings (17 items), acceptance of menarche (7 items), openness toward menarche (5 items), living with menstruation (8 items), and menstrual symptoms (9 items). Items are scored 1 for strongly disagree and 5 for strongly agree, except for the reversed items. The total possible score for the 58-item scale ranges from 58 to 290, with a high score indicative of a positive attitude and a low score indicative of a negative attitude. Cronbach’s α coefficients were 0.91 and 0.90 for the pre- and post-menarcheal versions, respectively [26]. In this study, the AMAQ had good internal consistency (Cronbach’s α, 0.80).

**Procedure**

Subjects were asked to evaluate their average menstrual pain on the first day of their last three menstrual periods using the VASP, which consisted of a 10-cm horizontal scale with descriptors “no pain” on the left and “worst possible pain” on the right. They were asked to move an adjustable mark to the place on the line that represented the intensity of their pain. Higher values indicated increased levels of pain. In all, 980 questionnaires were distributed based on stratified random sampling and 700 were collected (71.4%); 230 students experienced dysmenorrhea with a score higher than five on the VASP (32.8%), of whom 198 (86.1%) completed answered all questionnaires. Ethical approval was received from the Human Rights Committee at the Chung Hwa College of Medical Technology.

SPSS 10.0 for Windows (SPSS Inc, Chicago, IL, USA) was used for descriptive and inferential statistical analysis.

Pearson’s correlation was used to determine the relationships among demographic-menstrual variables, menstrual distress scores, and consequence indicators. Stepwise multiple regression was used to determine the best subset of predictors of menstrual distress. The significance level was set at p < 0.05.

**RESULTS**

The ages of the subjects ranged between 15 and 20 years (mean, 16.98 years) (Table 1). The mean onset of menarche was 12.31 years (range, 10–15 years), mean duration of menstruation was 6.99 days (range, 2–10 days), and mean frequency of menstruation was 28.10 days (range, 20–45 days).

Among the participants, 92.4% indicated that dysmenorrhea had a mild to severe impact on daily activity; 25.3% were absent from class at least sometimes and 39.9% used self-administered analgesics 1–6 times per cycle (Table 2). About half of respondents experienced menstrual pain on the first day (49.8%). The five most common symptoms of menstrual distress from the MDQ were cramps, fatigue, backache, swollen abdomen, and painful or tender breasts (Table 3).

Pearson correlations between demographic–menstrual variables and MDQ were positive for age, mother’s occu-

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Table 1. Demographic characteristics (N = 198)

<table>
<thead>
<tr>
<th>Age (yr)</th>
<th>n (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>15–17</td>
<td>123 (62.1)</td>
</tr>
<tr>
<td>18–20</td>
<td>75 (37.9)</td>
</tr>
<tr>
<td>Onset of menarche (yr)</td>
<td></td>
</tr>
<tr>
<td>10–12</td>
<td>106 (53.5)</td>
</tr>
<tr>
<td>13–15</td>
<td>92 (46.5)</td>
</tr>
<tr>
<td>Duration of menstruation (d)</td>
<td></td>
</tr>
<tr>
<td>2–6</td>
<td>53 (26.8)</td>
</tr>
<tr>
<td>7–10</td>
<td>145 (73.2)</td>
</tr>
<tr>
<td>Frequency of menstruation (d)</td>
<td></td>
</tr>
<tr>
<td>20–35</td>
<td>133 (67.2)</td>
</tr>
<tr>
<td>36–45</td>
<td>65 (32.8)</td>
</tr>
<tr>
<td>Socioeconomic status</td>
<td></td>
</tr>
<tr>
<td>High</td>
<td>12 (6.0)</td>
</tr>
<tr>
<td>Middle</td>
<td>114 (57.6)</td>
</tr>
<tr>
<td>Low</td>
<td>72 (36.4)</td>
</tr>
<tr>
<td>Mother’s occupational status</td>
<td></td>
</tr>
<tr>
<td>Employed</td>
<td>132 (66.7)</td>
</tr>
<tr>
<td>Unemployed</td>
<td>66 (33.3)</td>
</tr>
</tbody>
</table>
of the total variance in MDQ score, 59% could be explained by these four variables.

As shown in Table 6, impact on daily activity (0 = none, 1 = mild, 2 = moderate, 3 = severe), absence from class (0 = never, 1 = sometimes, 2 = usually, 3 = always), and analgesic usage (0 = none, 1 = 1–2 times per cycle, 2 = 3–4 times per cycle, 3 = 5–6 times per cycle) were positively correlated with MDQ. Absence from class and analgesic usage had positive correlations with impact on daily activity. Analgesic usage was positively correlated with absence from class.
Discussion

In accordance with previous studies, this study found that dysmenorrhea occurred most commonly on the first day of the menstrual period [5,9]. Several studies have shown that adolescents with dysmenorrhea report that it affects their academic performance as well as social and sporting activities, a distressing finding given the availability of effective medication [9,21]. The impact on daily activity rate in our study was 92.4%, higher than previously reported by Banikarim et al (50% among Hispanic adolescents) [9]. The school absenteeism rate in our study (25.3%) was lower than that reported by Hillen et al (45.6–54% in a Western Australian population) [21]. The variation in school absenteeism rates in these studies may be related to differences in cultural perceptions and responses to various gradients of pain. In a more positive view, menstruation is seen as a process of revitalizing the body and clearing impurities; menstruation is also indicative of childbearing potential in Chinese culture [16]. A study exploring 30 healthy Taiwanese women found that 46% believed that the onset of menstruation could be predicted and anticipated, and 78% of those women believed that menstruation was a natural event [27]. Kissling found that American adolescent girls conceal menstruation both symbolically and materially and that this concealment stems from its embarrassing nature [18]. Therefore, most Taiwanese adolescents are more tolerant of menstrual pain. Although menstrual pain has more impact on daily activities in Taiwanese adolescents than Western adolescents, the rate of absence from class during the menstrual period is lower. It is likely that, as we recruited paramedical students, their reactions to menstrual distress are different from the general population of adolescent girls. Secondly, most Taiwanese adolescents turn to Chinese medicine or bed rest to avoid the side effects of Western medicine. Most Taiwanese adolescents themselves do not have a habit of taking analgesics when they have menstrual pain, which is somewhat different from Western culture. American adolescent girls have less restricted daily activities because prophylactic treatment for dysmenorrhea is offered by nonsteroidal anti-inflammatory drugs [9]. Campbell and McGrath found that about 66% of adolescents who took medication for dysmenorrhea still experienced social and academic limitations, which suggests that these medications are often inappropriate or taken at incorrect doses [7]. Sveinsdottir [14], McMaster et al [15], and Lu [27] report that culture might influence the severity of symptoms such as pain and the ways in which they are treated. Ethnic background is a major determinant of how one expresses or communicates pain.

In our study, cramps were the most prevalent and severe symptom, followed by fatigue. These results are consistent with the findings of Lu [27] and Holroyd et al [28]. However, Banikarim et al found that fatigue was the most prevalent and severe symptom of menstruation [9]. They also found that headaches were the second most common symptom, revealing a cultural discrepancy that could result in symptomatic differences during the menstrual period.

The findings of our study supported those of Teperi and Rimpela, who found that age is positively correlated with menstrual pain and older adolescents generally have more severe dysmenorrhea; at age 12, the prevalence of dysmenorrhea was 48%, while at age 18 it was 79% [20]. Even though adolescents lack knowledge and experience of effective treatment, menstrual distress is probably not severe in its early stages. Our data differed from that of Campbell and McGrath, who reported that symptom severity was not significantly correlated with chronologic age but was positively associated with increases in gynecologic age [7].

Female adolescents, lacking experience in menstrual pain management, experience exaggerated menstrual pain. Menarche is a significant event for adolescent girls and mothers are important resources in preparing for menstruation [19,29]. Ou Yang found that the more highly educated the mother and the more open the communication between mother and daughter, the more positive the menstrual attitude [19]. This relationship was partially supported by our investigation. In our study, MDQ scores were significantly correlated with the mothers’ occupation; unemployed women’s daughters had more severe menstrual distress than employed women’s daughters. Possibly, employed women communicate more openly with their adolescent daughters and have more new knowledge about menstrual distress management, resulting in their adolescent daughters being more tolerant toward menstrual distress. This was similar to the findings of Farideh’s study [29].

We found that menstrual pain and menstrual attitudes were associated with the experience of menstrual symptoms. Like earlier studies [12,29], we found a significant correlation between attitude and menstrual symptoms. Lu found that the relationship between attitudes toward menstruation and menstrual symptoms is significant among Taiwanese women [27]. Our results were also consistent with those of Alonso and Coe, who concluded that negative attitudes toward menstruation were strongly associated with menstrual pain [12]. It has been reported that menstrual
pain is significantly associated with school absenteeism and decreased academic performance, sports participation, and socialization with peers [9]. These findings were supported by our investigation, in which menstrual pain and menstrual attitude were positively correlated with impact on daily activity, absence from class, and analgesic usage by respondents. Based on our data, we suggest that well-designed menstruation health education for adolescent girls should be developed and tested.

In conclusion, older age, an unemployed mother, severe menstrual pain, and negative menstrual attitude can predict an adolescent girl’s menstrual distress. Additionally, there is evidence that menstrual distress is significantly correlated with impact on daily activity, absence from class, and analgesic usage. It is suggested that school nurses should use these data to strengthen menstruation health education for adolescent girls to positively influence their quality of life during menstruation.

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REFERENCES

青春期少女經期不適之相關因素探討

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本研究目的在探討經痛青少女的經期不適症狀之相關因素和生活影響。方便取樣以台灣南部地區某技術學院有經期疼痛之青少女為對象，共收案 198 位。研究工具為結構式問卷，問卷內容包括：經期基本資料表、經期生理不適量表、簡易型麥克吉爾疼痛量表和青少女經期態度量表。使用之統計方法包括描述性統計、皮爾森積差相關、單變量變異數分析和逐步複迴歸分析。本研究結果發現：1. 最常見的五種月經不適症狀，依序為下腹疼痛、疲倦、腰酸背痛、下腹部腫脹和乳房腫痛。2. 經期不適之顯著預測因子包括：年齡較大、母親為家庭主婦、經期疼痛較強和青少女經期態度較負向，總解釋變異量為 59%。3. 經由相關分析發現，經期不適症狀會造成日常生活受限、缺課和自行服用止痛劑。本研究之結果可供臨床及學校衛生實務工作者做參考。

關鍵詞：青少女，原發性經痛

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