Personality Traits and Primary Dysmenorrhea: A Cross-Sectional Study in Iranian Medical Students

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Abstract: Background & Objective: Dysmenorrhea is a common problem and sometimes disabling condition among women of childbearing age. It plays several problems in personal and social life. Although few studies have explored the relationship between psychosocial factors and dysmenorrhea, the evidence for a psychological etiology is growing. The aim of this research was to find and explore a relation between psychological traits and primary dysmenorrhea. Methods: A cross-sectional study was conducted with two groups of medical students (medicine and paramedicine) of Babol University of Medical Sciences. Two hundred female students participated in the study (100 dysmenorrhea, 100 without dysmenorrhea). All subjects asked to complete 20-item Toronto Alexithymia Scale (TAS-20) with three subscales (difficulties in identifying feelings, difficulties in describing feelings, externally oriented thinking) and NEO-Five Factor Inventory of Personality (NEO-FFI) with five subscales (neuroticism, extraversion, openness to experience, agreeableness and conscientiousness). The T-test and multiple linear regression was used to analyze the data. Results: Multiple linear regression analysis after adjusting for age, age menarche, family history of dysmenorrhea, menstrual status and residence area showed that individual with dysmenorrhea had significantly more than non-dysmenorrhea in some personality traits scores; neuroticism ($\beta$=4.48, $p<0.01$), DIF ($\beta$=3.38, $p<0.01$) and total alexithymia score ($\beta$=5.65, $p<0.01$). Conclusion: Our results showed that dysmenorrhea is characterized by increased neuroticism and alexithymia. This study proposes that women with primary dysmenorrhea should be evaluated and treated by two departments of gynecology and psychiatry.

Key words: Primary dysmenorrhea • Personality traits • Neuroticism

INTRODUCTION

One of the common problems of women is dysmenorrhea which was formerly known as the mystery in gynecology. Primary dysmenorrhea is a Greek word describing painful contraction of uterine muscles that appears during women menstruation [1]. Primary dysmenorrhea is recognized by painful menstrual cramps without any organic pathology [2]. It usually occurs 3 years after menarche [3]. The prevalence rates in WHO systematic review ranged from 1.7% to 97% [4]. A survey showed that 63.5% of Iranian medical students suffered from menstrual pain [5].

Dysmenorrhea plays several problems in personal and social life [6]. Many people with suffering from menstrual pain are notable to perform their usual tasks[7]. Because women constitute at least 42% of adult workforce, millions of hours are losing annually. This way, if an effective medicine is not prepared for that, about 600 million hours will be loosed [8]. Therefore, economically-socially primary menstrual pain has always drawn serious attention and is considered as the reason of losing time, work and school [9]. So, it is a disabling condition among women of childbearing age [10].

Several factors have been proposed as possible etiologies of primary dysmenorrhea. According to physiological mechanism of menstrual pain, prostaglandins are related to myometrial contractions which results in uterine ischemia and pain [11]. Research proposed that dysmenorrhea should be considered as part of the spectrum of medically unexplained syndromes and viewed as a multifactorial disorder [12]. Although
psychosocial factors have not been studied extensively in relation to dysmenorrhea, the evidence for a psychological etiology is growing. Hikcyand Balen (2003) mentioned that menstrual irregularities can be used as an indicator of psychological adjustment social disorder in girls 13 to 19 years in the early years after menarche [13]. Ambresin et al., (2012) reported that patients with severe dysmenorrhea not only show a different profile from their peers in terms of their mental health, but they are also more dissatisfied with their body appearance [14]. Some psychological factors such as high emotional disturbance and psychological symptoms were found to be associated with higher rates of dysmenorrhea. Patel et al., (2006) emphasized that dysmenorrhea intensity increased with severity of depression, anxiety and somatic complaints [12]. A study found that negative attitudes toward menstruation are associated with dysmenorrhea [15].

Some research showed that somatoform disorders is found to be strongly associated with chronic pain syndromes and dysmenorrhea [16, 17]. It is thought that somatization may further contributeto the perceived intensity of menstrual pain and development of dysmenorrhea [18]. Previous studies reported that dysmenorrheic women tend to be more preoccupied with bodily sensations, tend to express greater negative attitudes toward illness and have more negative affect toward menstruation than do non-dysmenorrheic women [19, 20]. Also, primary dysmenorrhea has numerous associated somatic comorbidities such as nausea and vomiting, diarrhea, fatigue and feelings of irritability. In addition, many pain disorders such as irritable bowel syndrome, painful bladder syndrome and fibromyalgia are frequently comorbid with primary dysmenorrhea [21].

Alexithymia is considered to been a personality trait that seems to influence the development and manifestation of psychosomatic disorders [22]. Alexithymia is defined by; difficulty identifying feelings and distinguishing between feelings and the bodily sensations of emotional arousal, difficulty describing feelings to other people, constricted imaginal processes, a stimulus-bound, externally oriented cognitive style [23]. Although there is no published study to explain the role of alexithymia in women with dysmenorrheal, some research suggested the role of alexithymia in psychopathogenesis of psychosomatic disorders, especially chronic pain disorders [22, 24]. Also, some researchers showed that role of personality traits in dysmenorrhea in past decades 1980-2000, [25, 26]. There is few published study (after 2000 years) that is described the role of psychological factors, especially personality trait and alexithymiain patients with primary dysmenorrhea. The aim of this study was to find and explore a relation between psychological traits and primary dysmenorrhea. We compared university students with dysmenorrhea and without dysmenorrheal with validation questionnaires. We measured NEO-Five Factor Inventory of Personality (neuroticism, extraversion, openness to experience, agreeableness and conscientiousness) and alexithymia (difficulties in identifying feelings, difficulties in describing feelings, externally oriented thinking), in two group.

MATERIALS AND METHODS

This cross-sectional study was conducted with two groups of medical students (medicine and paramedicine) of Babol University of Medical Sciences. Two hundred female students participated in the study (100 dysmenorrhea, 100 without dysmenorrhea). Inclusion criteria for the students were primary dysmenorrhea (dysmenorrhea, which started 1 to 2 years after menarche), no history of pelvic-abdominal surgery and mental diseases. According to the Diagnostic and Statistical Manual of Psychological Disorders, Version IV– Text Revision [27], women with depression or anxiety disorder were excluded from the study by one experienced psychologist. Also, women with secondary dysmenorrhea excluded the study. The following criteria were used to define dysmenorrhea: beginning of pain within 6–12 hours after menstruation, lower abdominal pain associated with beginning of menstruation and lasting for 8–72 hours and lower back pain during menstruation [28]. The health care students with mild to severe primary dysmenorrhea entered the study. The dysmenorrheal pain was measured in each individual by multi-dimensional speech criteria [29]. Ethical approval was granted by the Medical Education Ethics Committee at Babol University of Medical Sciences.

A multistage cluster sampling was utilized to recruit the healthcare students based on their field and academic years. The researchers distributed three questionnaires to the respondents during a class hours. Permission was sought from the deans of faculty to distribute the questionnaires to targeted respondents. The researchers also gave a brief explanation regarding the purpose of the plan, reminded their respondents of their rights to not answer any question and how to fill in the questionnaires. The respondents were also told that their response would be treated with utmost confidentiality. All students asked
to complete three questionnaires. One questionnaire collected demographic information, one measure of 20-item Toronto Alexithymia Scale (TAS-20) and one measure of NEO-Five Factor Inventory of Personality (NEO-FFI). The questionnaire took only 30 minutes to complete.

Scales and Measurement: TAS-20: Alexithymia was evaluated with the self-reported 20-item TAS-20, which is a widely used and well-validated measure of this construct [30]. This instrument contains 20 items and three subscales that cover difficulty in identifying feelings (7 items), the difficulty in describing feelings (5 items) and externally oriented thinking (8 items). The scores are on a 5-point Likert scale measuring (1 to 5). The A valid version in Iranian population of the TAS-20 was used in this research [31].

NEO Five Factor Inventory (NEO-FFI): The NEO-FFI is a 60-item questionnaire that measures the five factors or domains (neuroticism, extraversion, openness, agreeableness and conscientiousness) to describe human personality Scales were developed by taking the 12 items with the highest positive or negative factor. Items of scale require responses on a five-point scale (1 to 5) from strongly disagree to strongly agree [32]. Neuroticism is sometimes called emotional instability. It is the sentiment to experience negative emotions, such as anger, anxiety, or depression. Extraversion is characterized by positive emotions and the sentiment to seek out stimulation and the company of others. Openness is a general understanding for art, emotion, adventure, unusual ideas, imagination, curiosity and variety of experience. Agreeableness is a sentiment to be compassionate and cooperative rather than suspicious and antagonistic towards others. Conscientiousness is a sentiment to show self-discipline, act dutifully and aim for achievement against measures or outside expectations [33]. Internal consistency (coefficient alpha) of the five scales report a coefficient of 0.73 [32]. A valid Persian version of the NEO-FFI was used in this study [34].

Statistic Analysis: In data analysis, we used SPSS software (Version 18.0). In univariate analysis, the t-test was used for comparison of scores of different component personal characteristic (TAS20, DIF, DDF, EOT, neuroticism, extraversion, openness to experience, agreeableness and conscientiousness) between with and without dysmenorrhea. In multiple linear regression analysis, the adjusted regression coefficient of dysmenorrhea was estimated on score of different component of personality traits, after adjusting the effect of age, menarche age, family history of dysmenorrhea, menstrual status and residence area.

RESULTS

The mean age of the participants was 20.54 years (SD = 1.74) and mean of menarche age 13.00 years (SD = 1.34); 73% of subjects lived in city and 27% in rural. Table 1 shows the individual characteristics and menstrual situations for two groups of dysmenorrheic and non-dysmenorrheic health students. Based on t-test, there were no significant differences between two groups in age and menarche age. Also, according to Chi-square test, no significant differences were found between two groups in menstrual status and residence area, whereas a significant differences were observed between family history of two groups (p ≤ 0.001/0). Table 2 show that students with dysmenorrhea had significantly higher mean scores than students with non-dysmenorrhea in some personality traits; neuroticism (p<0.001), openness to experience (p< 0.05), conscientiousness (p< 0.01), DIF (p<0.001), DDF, p< 0.01, EOT, p<0.001 and total score of TAS20, p< 0.001. Multiple linear regression analysis after adjusting for age, age menarche, family history of dysmenorrhea, menstrual status and residence area showed that individuals with dysmenorrhea had significantly more than non-dysmenorrhea in some personality traits scores; neuroticism (β=4.48, p< 0.01), DIF (β=3.38, p<0.01) and total alexithymia score (β=5.65, p<0.01). There was no significant correlation between dysmenorrhea and other personality traits subscales; extraversion, openness to experience, agreeableness and conscientiousness, DDF and EOT.

DISCUSSION

We found that dysmenorrheic women differ from non-dysmenorrheic women in some dimensions of personality traits. Dysmenorrheic women were more neurotic than non-dysmenorrheic women. Few studies are confirmed neurotic tendencies are very common among women with dysmenorrhea. Liang et al., (2012) concluded that dysmenorrhea group scored higher than the healthy control group on neuroticism-anxiety characteristic [35]. Asyrova (2010) reported 36% association of dysmenorrhea and structure of neurotic disorderse [36]. Khalajinia et al., (2008) reported that frequency of introversion, neuroticism and psychasthenia were more in the dysmenorrheic than non-dysmenorrheic subjects [37].
Table 1: Demographic characteristic among subject with and without dysmenorrhea

<table>
<thead>
<tr>
<th></th>
<th>Dysmenorrhea</th>
<th>No (N=100)</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age (mean ±SD, year)</td>
<td>20.42 ± 2.8</td>
<td>20.65 ± 1.68</td>
<td>0.351</td>
</tr>
<tr>
<td>Menarche age (mean ±SD, year)</td>
<td>13.04 ± 1.42</td>
<td>12.93 ± 1.19</td>
<td>0.624</td>
</tr>
<tr>
<td>Menstrual status</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Regular n (%)</td>
<td>74 (76.3%)</td>
<td>65 (67%)</td>
<td>0.152</td>
</tr>
<tr>
<td>Irregular n (%)</td>
<td>23 (23.7%)</td>
<td>32 (33%)</td>
<td></td>
</tr>
<tr>
<td>Residence area</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Urban n (%)</td>
<td>70 (71.4%)</td>
<td>73 (74.5%)</td>
<td>0.629</td>
</tr>
<tr>
<td>Rural n (%)</td>
<td>28 (28.6%)</td>
<td>25 (25.5%)</td>
<td></td>
</tr>
<tr>
<td>Family history of dysmenorrhea</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes n (%)</td>
<td>71 (73.2%)</td>
<td>42 (42.9%)</td>
<td>0.001</td>
</tr>
<tr>
<td>No n (%)</td>
<td>26 (26.8%)</td>
<td>56 (57.1%)</td>
<td></td>
</tr>
</tbody>
</table>

Table 2: The mean score of personality traits with respect to dysmenorrheal status

<table>
<thead>
<tr>
<th></th>
<th>Dysmenorrhea</th>
<th>No (N=100)</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>NEO(FFI)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Neuroticism</td>
<td>37.27 ± 7.56</td>
<td>31.80 ± 11.89</td>
<td>&lt; 0.001</td>
</tr>
<tr>
<td>Extraversion</td>
<td>26.70 ± 6.30</td>
<td>25.82 ± 5.61</td>
<td>&lt; 0.299</td>
</tr>
<tr>
<td>Openness to experience</td>
<td>33.15 ± 4.72</td>
<td>31.71 ± 5.32</td>
<td>&lt; 0.044</td>
</tr>
<tr>
<td>Agreeableness</td>
<td>27.46 ± 6.89</td>
<td>27.58 ± 5.48</td>
<td>&lt; 0.892</td>
</tr>
<tr>
<td>Conscientiousness</td>
<td>27.60 ± 6.52</td>
<td>29.65 ± 7.29</td>
<td>&lt; 0.037</td>
</tr>
<tr>
<td>TAS-20</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>DIF</td>
<td>20.01 ± 5.63</td>
<td>16.78 ± 4.61</td>
<td>&lt; 0.001</td>
</tr>
<tr>
<td>DDF</td>
<td>14.01 ± 4.06</td>
<td>12.43 ± 2.87</td>
<td>&lt; 0.002</td>
</tr>
<tr>
<td>EOT</td>
<td>20.31 ± 3.66</td>
<td>18 ± 4.29</td>
<td>&lt; 0.001</td>
</tr>
<tr>
<td>Total score</td>
<td>54.33 ± 11.49</td>
<td>47.22 ± 9.39</td>
<td>&lt; 0.001</td>
</tr>
</tbody>
</table>

Ranges of scores:
NEO-Five Factor Inventory of Personality (NEO-FFI): All subscales 12-60.
20-item Toronto Alexithymia Scale (TAS-20): DIF(difficulty identifying feelings), 1–35; DDF (difficulty describing feelings), 1–25; EOT (externally-oriented thinking), 1–40; total score of TAS-20, 1-100.

Table 3: Results of adjusted multiple linear regression coefficient of presence of dysmenorrhea

<table>
<thead>
<tr>
<th>Dependent variable</th>
<th>Coefficient (β)</th>
<th>SE (β)</th>
<th>t</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>NEO(FFI) Neuroticism</td>
<td>4.88</td>
<td>1.46</td>
<td>3.34</td>
<td>0.001</td>
</tr>
<tr>
<td>Extraversion</td>
<td>-0.87</td>
<td>1.16</td>
<td>-0.74</td>
<td>0.455</td>
</tr>
<tr>
<td>Openness to experience</td>
<td>-0.72</td>
<td>0.91</td>
<td>-0.79</td>
<td>0.427</td>
</tr>
<tr>
<td>Agreeableness</td>
<td>0.461</td>
<td>1.28</td>
<td>0.359</td>
<td>0.720</td>
</tr>
<tr>
<td>Conscientiousness</td>
<td>-0.669</td>
<td>1.25</td>
<td>-0.533</td>
<td>0.595</td>
</tr>
<tr>
<td>TAS-20 DIF</td>
<td>3.38</td>
<td>1.08</td>
<td>3.11</td>
<td>0.002</td>
</tr>
<tr>
<td>DDF</td>
<td>1.33</td>
<td>0.70</td>
<td>1.88</td>
<td>0.06</td>
</tr>
<tr>
<td>EOT</td>
<td>1.27</td>
<td>1.49</td>
<td>0.85</td>
<td>0.39</td>
</tr>
<tr>
<td>Total score</td>
<td>5.65</td>
<td>2.12</td>
<td>2.6</td>
<td>0.009</td>
</tr>
</tbody>
</table>

*The regression coefficient was adjusted for age, age menarche, family history of dysmenorrhea, menstrual status and residence area

How relationship between dysmenorrhea and neuroticism characteristic is unclear. The first hypothesis indicate to the release of prostaglandins and ischemic pain as a result of vasoconstriction might underline the high neuroticism characteristic. Some evidence supported the hypothesis. Roeska et al., (2009) suggested that vasopressin plays a role in processing anxiety [38]. A study reported that, the concentrations of prostaglandins (PGD2, PGE2 and PGF2α) in the saliva of patients with major depressive disorder were significantly higher than those of the healthy controls [39]. The second hypothesis refer to the nature of the neuroticism. Neuroticism is interlinked with low endurance for stress or aversive stimuli. Neurotic individuals are more likely to interpret ordinary situations as threatening and minor frustrations as hopelessly difficult [40]. Neurotic people are predisposed to experience negative emotions, such as anger, anxiety, depression, self-concern impulsiveness and vulnerability [33]. Some evidences support the hypothesis in dysmenorrheic women. Lopez, (2010) reported that women with primary dysmenorrhea suffered from more depression symptoms than normal women [41]. Another research confirmed that women with sever dysmenorrhea have more aggressive than women who never experienced dysmenorrhea [42]. The third hypothesis refers to influence of neuroticism characteristic on pain perception. It is appear that neuroticism is a vulnerability factor, lowering the threshold at which pain is perceived as intense an threatening [43]. In addition, neurotic patients are more likely to use poor strategies to cope with pain [44]. Finally, high neuroticism is associated with the belief that pain is mysterious, aversive and will endure throughout of life [45]. Some evidence supported the hypothesis of relationship between neuroticism and dysmenorrheal pain. Granot et al., (2001) emphasized that women with dysmenorrhea were more anxious compared with non-dysmenorrheic women. Also, they showed enhanced pain perception compared to non-dysmenorrheic women [46]. A systematic review reported that anxiety and neuroticism was more in women with pelvic pain than in pain-free controls [4].

Our results indicated that women with dysmenorrhea had more total scores of alexithymia and subscale of DIF than women without dysmenorrhea. Findings noting higher levels of alexithymia in dysmenorrheic chronic pain patients are consistent with the earlier research. Pecukonis et al., (2009) and Hosoi et al., (2010) that suggested women with chronic pain had significantly higher scores on the measure of alexithymia [47, 48].
How is alexithymia associated with the development of dysmenorrhea? Some of the possible underlying mechanisms have been proposed. First, individuals with high alexithymia have difficulties in recognizing their own physical and emotional symptoms, which may be linked to develop somatization pains. Previous research supported that dysmenorrhea is not just a syndrome of painful uterine contractions, but rather represents an increased pain perception related to somatization [49, 50]. Second, individuals with high alexithymia have impaired emotion-processing and regulating capacities which might induce disruption of homeostasis through alterations of autonomic, endocrine and immune activities [51]. Third, individuals with high alexithymia have a limited ability to cope adaptively with stressful events [52, 53]. There is potential general hypersensitivity to both internal (somatic) unpleasant sensations and externally induced pain, in individuals with high score in alexithymia may be associated with an enhanced sensitivity [54]. Forth, alexithymia has been shown to be associated with chronic pains by its effects on negative affect [55]. Finally, high levels of alexithymia are associated with limited social support, impaired interpersonal or social skills, fewer close relationships and preoccupation with somatic complaints and depression [56, 57]. Thus, it has been hypothesized that the limited emotional awareness and impaired cognitive processing of affects in alexithymia promote amplification of the somatic component of emotional arousal, resulting in increased vulnerability to somatization disorders, exacerbation of emotional numbing and ultimately increased risk of dysmenorrhea.

A few study limitations should be mentioned. First, the cross-sectional nature of our study prevents any conclusion regarding causality. Second, data collection has been performed by self report using questionnaires. The certainly of its accuracy should be considered with caution. Future research might include a more detailed and complete view on alexithymia in particular might be obtained by using alternative methods such as interviews. Finally as the study was the first article revealed that the relationship of alexithymia and dysmenorrhea, further research is needed to determine the extent to how the associations are been explained. Also, further studies are needed to explain the role of cultural variables in association between personality traits and dysmenorrhea.

In conclusion, our results showed that dysmenorrhea is characterized by increased neuroticism and alexithymia. This study proposes that women with dysmenorrhea should be evaluated and treated by two departments of gynecology and psychiatry.

ACKNOWLEDGMENT

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REFERENCES


