REVIEW ARTICLE

Conceptual Analysis of Menstrual Disorders in Young Women

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ABSTRACT

To define the concept of menstrual disorders in young women.

Articles were searched from PubMed (2010-2020) using the keywords “Young Women,” “Dysmenorrhea” and “Premenstrual Syndrome.” Eight articles were extracted from 32 articles. Regarding articles in Japan, Japan Medical Abstracts Society website and CiNii Articles were searched, using the keywords “Young Women” and “menstrual disorders.” 23 articles were extracted from 165 articles. A total of 31 articles (23 articles in Japan, 8 articles from overseas) were targeted.

Six attributes: Actual condition of menstrual disorders, risk of menstrual disorder, endometriosis and treatment, use of analgesics, use of oral contraceptives (hereinafter OC), and Quality of Life (hereinafter QOL) in menstrual period. Five preconditions: Young women and motivation, women's lifestyle and change in life habits, menstrual mechanism and normal values, classification and symptoms / treatment of menstrual disorder, view of menstruation and menstrual education. Four consequences: Awareness of menstruation, education surrounding menstruation, research on menstruation, and issues related menstruation were extracted.

This concept was defined as “in actual conditions of menstrual disorders, there is great variation, such as dysmenorrhea, PMS, and irregular menstruation, and accordingly, related risks have been observed, and the existence of endometriosis is also partially indicated. Analgesics and OC are not appropriately utilized, and QOL of young women during menstrual period decreases.”

< Key-words >
Young women, menstrual disorders, conceptual analysis

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I. Introduction

Regarding the study background, when a self-care scale for young women with menstrual pain was prepared, it was indicated that young women with strong menstrual pain do not properly care for themselves, their symptoms are not improved by self-care. Consequently, they need to visit a gynecologist\(^1\).

A survey by the Japan Association for The Advancement of Working Women (2004) pointed out that 27.1% of women 25 years old and younger visit a gynecologist for irregular menstruation. However, in contrast, 55.9% did nothing. Regarding degree of menstrual pain, 43.1% of women 25 years or younger responded “very bad,” and “bad”. However of these, only 13.6% visit a gynecologist, and 28.8% did nothing.\(^2\)

Similarly, the rate of consultation among women 25 years or younger was less than 30%, even though they had irregular menstruation and approx. 10% had strong menstrual pain. Menstrual disorders were often overlooked. According to Mochizuki, the most frequent main complaint by young women visiting a gynecologist is menstrual disorder.\(^3\)

Furthermore, most surveys on menstrual disorder in young women are small-scale studies. Approximately 80% of girls with menstruation-related disorders were reported to experience difficulty in their physical exercises and study but did not consult with anyone. Consequently, an accurate portrayal of the actual condition of menstruation in pubescent girls is still not understood.\(^4\)

Currently, no studies have been carried out which define the concept of menstrual disorders in young women. Identifying the conceptual structure of menstrual disorders in young women would be meaningful for health-care professionals and deepen their understanding, as well as be the foundation for future research. Consequently, the purpose of this study is to define the conceptional structure of menstrual disorders in young women by conceptual analysis.

II. Operational definition of terms

Young women: women in their late teens to early 20s who have experienced ovulatory cycles for several years after their first menstruation and are more susceptible to functional dysmenorrhea.
III. Research method

1. Selection of Articles

Articles from overseas were searched from PubMed (2010-2020) using the keywords “Young Women,” “Dysmenorrhea” and “Premenstrual Syndrome,” and conference minutes and review papers were excluded, and then original papers between 2010 and December 2020 were searched. The search was then narrowed down to articles published in academic magazines and with an abstract. resulting in a total of 32 articles extracted. From these 32 articles, studies regarding diseases and therapeutic agents, and studies with a theme other than exercise and menstruation were excluded, and 8 articles which could be obtained in full-text were extracted.

For articles in Japan, Japan Medical Abstracts Society website and CiNii Articles were searched using the keywords “Young Women” and “menstrual disorders.” 165 original papers published between 2010 and December 2020 were extracted. After conference minutes and review paper were excluded, 78 articles were extracted.

From these 78 articles obtained by the search, studies on a specific diseases and coldness, and studies targeting only athletes, were excluded, an article regarding the latest research on menstruation by the author was added, and a total of 23 articles were extracted. 8 articles from overseas and 23 articles in Japan, for a total of 31 articles, were targeted for analysis (refer to Fig. 1).

| Articles in Japan |
|-------------------|
| Japan Medical Abstracts Society Website version, CiNii Articles (2010-2020) |
| Young women and menstrual disorders n=165 |
| Conference minutes / abstracts were excluded n=78 |
| Conditions of exclusion: The subjects are athletes, specificity to cold and diseases |
| Addition: one |
| Final articles in Japan n=23 |

| Articles from Overseas |
|------------------------|
| PubMed (2010-2020) |
| Young women and Dysmenorrhea and Premenstrual Syndrome |
| Conference minutes / abstracts were excluded n=32 |
| Conditions of exclusion: Articles with a theme other than menstrual, such as disease, therapeutic agents, and exercise. |
| Article which could be obtained in full text: |
| Final articles in overseas n=8 |

N=31

<Figure 1> Article extraction method and number of articles
2. Data analysis method

In this study, the conceptual analysis method of Rodgers (2000) was used to determine the conceptual analysis of menstrual disorders in young women. Since the philosophical foundation of this analysis has been refined and developed by changes over time, Rodger’s conceptual analysis was considered appropriate as the lifestyle of women with menstrual disorder has greatly changed over these past 30 years, and the environment surrounding young women is predicted to change with each generation.

The targeted articles were read intensively, attributes which comprise the concept, preconditions which show the background of menstrual disorders in young women and contents that correspond to the consequences as a result of the concept, were encoded and extracted. After that, the articles were divided into attributes, preconditions, and consequences, and the codes are classified into sub-categories, then the common items of the sub-categories were categorized, and correlation between categories were shown in a conceptual diagram (refer to Fig.2).

To ensure reliability and validity of the analysis, two professors of maternity nursing education supervised the analysis.

3. Ethical consideration

For the articles used in this study, quoted articles and the original sources were clearly described so as to avoid any copyright infringement.

IV. Results

The constructed concept of menstrual disorders in young women is shown in Fig. 2. Hereinafter, categories are shown as { }, sub-categories as [ ], and codes as “ ”. Here, the extracted categories are explained.

![Concept construct of menstrual disorders in young women](image-url)
1. Attributes (Refer to Table 1)

As attributes of menstrual disorders in young women, six categories were extracted.

1) {Actual condition of menstrual disorders}

“Recognized symptoms of menstrual disorders increased 80% in Japan and abroad,”[^5] “Symptoms of menstrual disorders affected daily life / academic activities,”[^7] [Actual condition of symptoms during menstruation] increased, especially, [rate of dysmenorrhea and causes] exceeded 80%, with “excessive production of prostaglandin” determined to be the cause[^8]. [Actual condition of irregular menstruation] was also approx. 25%, and “50% of women who have irregular menstruation had polycystic ovary syndrome (hereinafter referred to as PCOS).”[^9]

In [Actual condition of menstruation concomitant symptoms / perimenstrual symptoms], “98.4% had symptoms.”[^5] In [Actual condition of menstrual pain], “lower abdominal pain (91%), lumbar backache (52.8%)” were observed. Regarding the [Actual condition of PMS], “In Europe, persons with premenstrual symptoms exceed 90%.” Also in Japan, “Patients with PMS and PMDD could potentially be 180,000 persons.” From this, the [Actual condition of menstrual disorders] affects most young women.

2) {Risks of menstrual disorders}

Among the [Risks of PCOS / irregular menstruation], “Ovulation disorder is the cause of 25-30% cases of infertility”[^12] and among [Risks of dysmenorrhea], the “risk of endometriosis is 2.6 times higher”[^13] and among [Risks of PMS], “persons with a family history of such risks are 4.19 times more likely to experience PMS.”[^14]

Furthermore, among the [Risks of hypermenorrhea], the “Risk of anemia” can be mentioned[^7,15] and regarding [Risks of abnormal age of menarche], “the risk of abnormal bleeding is 6.92 times higher.” From this, the {Risks of menstrual disorder} are very large.

3) {Endometriosis and treatment}

[Early endometriosis] can easily be “diagnosed as functional dysmenorrhea since internal examination and image diagnosis are not possible.”[^4,13] [Causes of endometriosis] are “related to hormones and periodic menstruation,”[^16] and one of the [Signs of endometriosis] is “dysmenorrhea, which has spread among young women.”[^16] Furthermore, since “Late diagnosis of endometriosis” is listed among [Diagnosis and treatment of endometriosis][^10], early detection of {Endometriosis and treatment} are difficult and delay in treatment is common.

4) {Use of analgesics}

Regarding the [Period of use of analgesics], it is “use is recommended in the early phase.”[^9] However, “persons who are averse to their use is 65%”[^9] due to [anxieties regarding use]. Consequently, [education of analgesics] is needed. Furthermore, regarding
the [rate of use of analgesics], “25-60% of young women use over-the-counter drugs.”

As a result, the “analgesic effect” is “insufficient in 40% of cases.”

Regarding [Therapeutic agents], “administration of NSAIDs” is standard.

5) {Use of OC}

[Characteristics of OC users] include a “higher average age and a higher level of physical activity”.

Regarding [Efficacy of OC], “reduction in the amount of menstruation bleeding in RCT was clearly evident in 43% cases when administered to women with hypermenorrhea.”

However, the [Rate of use of OC] was found to have “a low distribution rate in Japan.”

6) {QOL during menstrual period}

“Q-LES-Q-SF” is a scale which can appropriately measure menstrual cycle QOL. However, [satisfaction during menstrual period] was resulted in “satisfaction in the perimenstrual period in women 25 years and younger,” and “rate of participation in the labor force for women 20-24 years old with functional dysmenorrhea is 69.1%, a decrease in not only QOL, but also QOW is observed.” [Menstrual disorder adversely affects QOL, and QOL during menstrual period decreases.]
Table 1: Attributes of menstrual disorders in young women

| Categories | Subcategories | Main code | Documentation |
|------------|---------------|-----------|---------------|
| Actual condition of menstrual disorders | In Japan and abroad, menstrual symptoms were 50% before 1983 and increased to more than 60% after 2000; the number of young women complaining of menstrual symptoms over 30 years increased. | Kaimura & Ueda | 6 | 9 |
| Premenstrual and menstrual symptoms affect daily life / academic activities. | | 7 | Farideh, Sakineh & Mojgan |
| Menstrual symptoms include lower abdominal pain (75%), bloating (75%), irritability (75%), increased appetite (54%), and acne (62%). | | 17 | Alića, Jaroš & Ahmed |
| Prevalence of lower abdominal pain was lower for East Asians than for Caucasians and South Asians. | | 17 | Alića, Jaroš & Ahmed |
| Dysmenorrhea is the most common menstrual symptom with a prevalence of 85%. | | 6 | Adachi |
| Dysmenorrhea is observed in 26% of 22-27 year olds and decreases to 21% for 31-36 year olds. | | 19 | Farideh, Sakineh & Mojgan |
| 7.7-9.7% were absent due to dysmenorrhea, 21.5% had reduced social activities, and back pain, headache, heavy bleeding were observed in half of the subjects. | | 19 | Farideh, Sakineh & Mojgan |
| Prevalence of dysmenorrhea in Australian teens was 93%, 80% in Egyptian teens. A universal method to evaluate dysmenorrhea is lacking. | | 8 | Emmanuel, Emmanuel, Samuel, Yavas, Xin & Xuqing |
| Excessive prostaglandin production is a cause of dysmenorrhea pain. | | 14 | Mukulken, Momo & Desalegn |
| Prevalence of dysmenorrhea in Ethiopia is 85.1%, due to family history and circumcision (female genital mutilation). | | 14 | Mukulken, Momo & Desalegn |
| 90% of cases of dysmenorrhea experience lower abdominal pain, 24.5%, headache, 13.3%, moderate pain, 9.1%. | | 10 | Momo & Desalegn |
| Other non-medical faculty showed a 2.5 to 3 times higher risk of menstrual pain. Women in late teens to early 20s have strong menstrual pain. | | 10 | Momo & Desalegn |
| Menstrual pain symptoms include lower abdominal pain, headache, back pain, nausea, diarrhea, etc. | | 10 | Momo & Desalegn |
| Mild pain (17.4%), 80% of those with menstrual pain experience difficulty in daily life, lower abdominal pain (91%), lumbar backache (52.8%). | | 10 | Momo & Desalegn |
| Subjects with constant menstrual pain all the time (56.9%), occasional pain (43.1%), extreme pain (14.6%), moderate pain (68.1%). | | 5 | Kaimura & Ueda |
| Mid pain (77.4%), 80% of those with menstrual pain experience difficulty in daily life, lower abdominal pain (91%), lumbar backache (52.8%). | | 5 | Kaimura & Ueda |
| Menstrual pain symptoms include lower abdominal pain, headache, back pain, nausea, diarrhea, etc. | | 5 | Kaimura & Ueda |
| Subjects experience premenstrual symptoms exceeded 80% in Europe, 77.3% of women have psychological impairment before and during menstruation, 30% PMS, 8% PMDD. | | 10 | Mark, Theo, Moniek, Didik & Anneke |
| There are potentially 180,000 patients with PMS and PMDD, 1-4%, with PMDD in Japan, 5-20% with moderate to severe PMS. | | 10 | Mark, Theo, Moniek, Didik & Anneke |
| Psychosocial symptoms of premenstrual symptoms were irritability (54.8%), fatigue (28.7%), depression (28.3%), anxiety/tension (23.7%), headache (19.0%), joint and muscle pain (17.3%). | | 14 | Mukulken, Momo & Desalegn |
| The prevalence of PMS increases with dysmenorrhea, and school absenteeism and decreased work productivity were observed in patients with moderate to severe PMS. | | 19 | Farid, Sakineh & Moghan |
| More than 60% of subjects experience premenstrual irregular symptoms. Premenstrual irregular symptoms have a negative impact on interpersonal problems, and many college students have premenstrual symptoms. | | 10 | Momo & Desalegn |
| PMDD is observed in 35% of 22-27 year olds and decreases to 41% for 34-39 year olds. | | 27 | Brown W, Dobson A, Bryson L & Byles J |
| Alternation of menstrual disorders | PCOS is a risk of endometrial hyperplasia and endometrial cancer due to long-term estrogen exposure due to anovulation. Not only for amenorrhea treatment, but regular cancer screening, risk factors for future hypertension, hyperlipidemia, and diabetes. | | 3 | Mochizuki |
| Factors such as age, age at menarche, drinking, lack of exercise, lack of socializing, and BMI increase the risk of developing menstrual irregularities. | | 6 | Emmanuel, Emmanuel, Samuel, Yavas, Xin & Xuqing |
| Menstrual disorders are a risk for developing osteoporosis, uterine cancer, etc. Ovulation disorders are the cause of infertility in 25-30% cases. | | 12 | Iwasa, Matsuzaki & Irahara |
| About 70% of menstrual disorders are caused by abnormalities of the central hypothalamic-pituitary system. | | 12 | Iwasa, Matsuzaki & Irahara |
| Irregular menstruation is associated with a 28% increase in the risk of coronary heart disease and a higher risk of type 2 diabetes. | | 10 | Ahmed, Alia & Nadia |
| More than 60% of subjects experience premenstrual irregular symptoms. Premenstrual irregular symptoms have a negative impact on interpersonal problems, and many college students have premenstrual symptoms. | | 10 | Ahmed, Alia & Nadia |
| Patients with functional dysmenorrhea have a 2.8 times higher risk of developing endometriosis in the future. | | 10 | Ahmed, Alia & Nadia |
| Persons with a family history of dysmenorrhea are 4 times more likely to develop dysmenorrhea, Dysmenorrhea is a hereditary factor. | | 10 | Ahmed, Alia & Nadia |
| Persons with a family history of PMDD are 4.19 times more likely to experience PMDD, and those with irregular menstruation are 4.19 times more likely to experience PMDD. 1.87 times more likely to have PMDD, due to irregular menstruation which can cause PMDD. | | 14 | Mukulken, Momo & Desalegn |
| Blood loss due to menstruation affects QOL, heavy bleeding is a risk for anemia. | | 7 | Farideh, Sakineh & Alia & Nadia |
| Abnormal age at menarche is 4.79 times that of the normal age of menarche, risk of rare menstruation is 3.17 times, and risk of abnormal bleeding is 8.62 times. Prevalence is high when age at menarche is less than 11 years or more than 14 years. | | 7 | Farideh, Sakineh & Alia & Nadia |
## Early Endometriosis
Endometriosis cannot be diagnosed by internal examination or imaging, so it is diagnosed as functional dysmenorrhea, functional dysmenorrhea is an early stage of endometriosis exists, endometriosis causes infertility in 30-50% of women, treatment begins early in women with severe dysmenorrhea.

| Causes of Endometriosis | Early \begin{itemize} \item Endometriosis is present in 6-10% of women of reproductive age, onset is related to sex steroid hormones and cyclical menstruation. \item Dying causes abnormal uterine muscle contraction due to hormone stimulation, resulting in increased menstrual blood reflux which promotes the development of endometriosis lesions. \end{itemize} 
Signs of endometriosis \begin{itemize} \item 13.0% of students experience menstrual pain extending to the anus, which is an indicator of endometriosis. \item Dysmenorrhea that progresses in young women and chronic pelvic pain outside of the menstrual period is endometriosis. \item 10% of cases of severe dysmenorrhea show uterine abnormalities, and dyspareunia may indicate endometriosis. \end{itemize} 
Diagnostic and Treatment of Endometriosis \begin{itemize} \item Many general practitioners consider the diagnosis of endometriosis to be late. \item Treatment is pain control and inhibiting progression of endometriosis lesions, NSAIDs and low-dose pills are used, but if no effect, laparoscopic surgery is performed. \end{itemize} | 4) Adachi, 15) Memedi |

| Diagnosis and Treatment of Endometriosis | Early \begin{itemize} \item Endometriosis is seen in 25-70% of young women with chronic pelvic pain after laparoscopic surgery. \item Incidence of endometriosis greatly increases in women over 20 years of age. \item Treatment is pain control and inhibiting progression of endometriosis lesions, NSAIDs and low-dose pills are used, but if no effect, laparoscopic surgery is performed. \end{itemize} 
Signs of endometriosis \begin{itemize} \item 13.0% of students experience menstrual pain extending to the anus, which is an indicator of endometriosis. \item Dysmenorrhea that progresses in young women and chronic pelvic pain outside of the menstrual period is endometriosis. \item 10% of cases of severe dysmenorrhea show uterine abnormalities, and dyspareunia may indicate endometriosis. \end{itemize} 
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2. Preconditions (Refer to Table 2)

Regarding preconditions influenced by the subjects, {Young women and motivation}, {women’s lifestyle and change in life habits}, could be extracted, those influenced by menstruation itself, five preconditions, namely {menstrual mechanism and normal values}, {classification and symptoms / treatment of menstrual disorders}, and {view of menstruation and education of menstruation} were extracted.

1) {Young women and motivation}

[Definition of young women] is “women in their late teens to early 20s who experience extreme menstrual pain” and do carry out self-care without “[motivation] of goals”.

2) {Women’s lifestyle and changes in life habits}

[Change of women’s lifestyle] is large. Late marriage and births later in life tended to increase the frequency of menstruation, and as a result, “increased dysmenorrhea.” The [effect on reproductive function] occurred due to [changes in life habits] and [the effect of missing breakfast].

However, there is a strong [desire to lose weight], and [meals and life rhythm are important], so there is a need for [intervention of life habits].

3) {Menstrual mechanism and normal values}

[Definition of menstruation], [normal values of menstruation], [menstrual feedback mechanism], and [normal value of first menstruation] are almost the same in Japan and abroad.

4) {Classification and symptoms / Treatment of menstrual disorders}

Menstrual disorders are varied and classified as [Abnormality in the first menstruation period], [definition of menstrual disorder], [causes and classification of amenorrhea], [disorders in menstrual cycle], [abnormal bleeding], [definition of dysmenorrhea], [tendency of dysmenorrhea], [functional dysmenorrhea and organic dysmenorrhea, definition], [symptoms of PMS], [causes and treatment of PMS], and [tendency of PMS].

5) {View of menstruation and education on menstruation}

Since “younger women have a more negative view of menstruation,” they have “strong menstruation concomitant symptoms.” Although “The Netherlands is an open society, the taboo of menstruation has not broken.” The [menstruation taboo] exists. In Japan, [Dissatisfaction regarding menstrual education and lack of knowledge] is observed, [Coping behavior during menstrual period] is not effective.
### Preconditions of menstrual disorders in young women

| Categories                          | Sub-categories              | Main code   | Documentation |
|-------------------------------------|-----------------------------|-------------|---------------|
| Young women over 18 years old and under 25 years old | Definition of young women | 1) Yamamoto, 20) Fukuyama | Provision of knowledge is needed, but without the motivation of goals necessary for self-care, self-care is not carried out. |
| Motivation                          | Behaviors and life habits which lead to improved QOL include the reasons for the behavior, preparation factors that motivate behavior, and the behavior itself. There are reinforcing factors that provide continuous and sustained rewards and motivation, and enabling factors needed to realize the behavior. | 5) Kaimura, 6) Narahara | 5) Provision of knowledge is needed, but without the motivation of goals necessary for self-care, self-care is not carried out. |
| Change in women’s lifestyle         | Changes in women’s lifestyle: 1) westernized diet, 2) earlier sexual maturity, 3) higher education, 4) increase number of working people, 5) Marriage later in life, 6) Decreased birthrate, 7) Increased frequency of menstruation, 8) Increased life expectancy | | 1) Yamamoto, 5) Kaimura, 25) Fujiwara |
| Increased stress                    | Stress among women aged 12 and older was 40.4% in 1993 and 52.2% in 2007. Stress is higher among younger women. | | 5) Kaimura, 6) Narahara |
| Effect of missing breakfast         | Missing breakfast negatively affects menstrual cycle disorders, reproductive function, and affects daily QOL. | 25) Fujiwara | 25) Fujiwara |
| Diet and the desire to be thin      | Abnormalities in reproductive function caused by irregular dietary habits occur and interfere with the period of motherhood. Diet restrictions which are disassociated with diurnal rhythms have a synergistic negative effect on reproductive functions. | 25) Fujiwara | 25) Fujiwara |
| Intervention in the habits         | Comprehensive interventions to effectively regulate behavior and life habits, and promotion factors are needed. | 5) Kaimura, 6) Narahara | 5) Kaimura, 6) Narahara |
| Consistency in meals and life rhythm | Consistency in meals and life rhythm can minimize the negative affect reproductive function while dieting. | 25) Fujiwara | 25) Fujiwara |

#### Menstrual mechanism and normal values

**Definition of menstruation**
- Menstruation is periodic bleeding from the endometrium which occurs approximately once a month and stops spontaneously within a limited number of days. (20) Fukuyama
- Menstruation is cyclical bleeding of the endometrium caused by the disarrangement of sex steroid hormones secreted by the ovaries. (25) Fujiwara

**Menstruation and normal values**
- A normal range is a cycle of 25-38 days, with ±6 day variation, lasting 3-7 days and 20-140 ml of menstrual bleeding. (20) Fukuyama
- If ovulation is regular, average blood loss is 52.3±10.84 ml, cycle is 26-35 days, bleeding is 3-6 days with a maximum of 8-24 ml, and consists of 7-9 days. (ElEmmanuel, Samuel, Xueqing, Ueda, 22) Kaimura, 25) Fujiwara

**Menstrual feedback mechanism**
- In young women, the hypothalamic-pituitary-ovarian system is immature, there is anovulation shortly after menarche, and there is no ovulation. Cycles are indeterminate during the first 2 years after menarche, 80% at 5 years, and more than 90% at 6-7 years. (Yamamoto, 20) Fukuyama

**Normal values of the first menstruation**
- Mean age of menarche is 12.3±1.5 years, range is 11-16 years. (ElEmmanuel, Samuel, Xueqing, Ueda, 22) Kaimura, 25) Fujiwara, 15) Ahmed, Atiea & Nada

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Table 2: Preconditions of menstrual disorders in young women

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| Abnormal Timing of Menarche | Definition of Menstrual Disorder | Causes and Classification of Amenorrhea | Menstrual Cycle Disorder | Abnormal Bleeding | Definition of Dysmenorrhea | Trends in Dysmenorrhea | Menstrual Symptoms | Causes and Treatment of PMDD | PMS Symptoms | Trends in PMS | Negative View of Menstrual and Menstrual Education | Coping Behavior during Menstrual Period |
|-----------------------------|---------------------------------|----------------------------------------|-------------------------|------------------|--------------------------|------------------------|-------------------|---------------------|----------------|-------------|-----------------------------------------------|-------------------------------------|
| Menarche at or less than 10 years of age (premenstrual menarche), menarche at 15 years of age or older (delayed menarche), no menstruation until 18 years of age. | Secondary amenorrhea: absence of menstruation for more than 3 months | Causes of secondary amenorrhea: reduced eating (45%), overeating (6.5%), stress (10.7%). There are two types of secondary amenorrhea: first-degree amenorrhea and second-degree amenorrhea. | Abnormal menstrual cycle: hypothalamic-thyroidian dysfunction, suppression causes: inappropriate eating habits, stress, excess exercise | Increased menstrual cycle disorder, past experience dieting: no menstrual cycle disorder but strong menstrual pain. | Dysmenorrhea, under 25 years old 45.1%, school life affected 45%. | Menstrual complaints in more than 70% to 90% of cases of severe menstrual pain in late teens and early 20s. | Physical symptoms include swelling, headache, fatigue; psychological symptoms including anxiety, depression, etc. | Menstrual complaints are called PMDD. | Many symptoms occur in the late luteal phase and decrease a few days after the onset of menstruation. | Symptoms disappear with the onset of menstruation in 97.8% of cases of PMS. When symptoms appear, daily life is affected | A negative view of menstruation: to be "troublesome" is strong, and the younger the person is, the more negative the view of menstruation is. | Regarding frequently used medications such as analgesics, have students read the package inserts in class and recognize specific side effects. |
| Secondary amenorrhea: absence of menstruation for more than 3 months | Frequent menstruation: menstrual cycle of 24 days or less. Rare menstruation: menstrual cycle of 35 days or more. Irrregular cycle: menstruation that does not match the normal cycle of 25-28 days, cycle variation: continues within 30 days | Causes of secondary amenorrhea: reduced eating (45%), overeating (6.5%), stress (10.7%). | Increased menstrual cycle disorder, past experience dieting: no menstrual cycle disorder but strong menstrual pain. | Increased menstrual cycle disorder, past experience dieting: no menstrual cycle disorder but strong menstrual pain. | Dysmenorrhea, under 25 years old 45.1%, school life affected 45%. | Menstrual complaints in more than 70% to 90% of cases of severe menstrual pain in late teens and early 20s. | Physical symptoms include swelling, headache, fatigue; psychological symptoms including anxiety, depression, etc. | Menstrual complaints are called PMDD. | Many symptoms occur in the late luteal phase and decrease a few days after the onset of menstruation. | Symptoms disappear with the onset of menstruation in 97.8% of cases of PMS. When symptoms appear, daily life is affected | A negative view of menstruation: to be "troublesome" is strong, and the younger the person is, the more negative the view of menstruation is. | Regarding frequently used medications such as analgesics, have students read the package inserts in class and recognize specific side effects. |
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3. Consequences (Refer to Table 3)

Regarding consequences, four categories, namely {Awareness of menstruation}, {education surrounding menstruation}, {research on menstruation}, {issues related to menstruation} were extracted.

1) {Awareness of menstruation}

Regarding [Acceptance of menstruation], “modification of awareness of menstruation”\[^{23}\] and “comprehensively understanding physical, mental, and social factors,”\[^{5}\] and “education of knowledge regarding perimenstrual symptoms, and enlightenment / PR activities”\[^{24}\] are needed.

Furthermore regarding [Awareness of premenstrual symptoms], “rather than negatively accepting it, assisting a person to understand the importance of acceptance”\[^{24}\] is valuable.

2) {Education surrounding menstruation}

In [Actual condition of visiting a gynecologist], “85.9% of women in their 20s experience PMS, but awareness of disease and visits to a gynecologist are low.”\[^{11}\] The rate of visiting a gynecologist is not high. Regarding [Support during the menstrual period], since there is little “information support,”\[^{5}\] it does not lead to “continued knowledge and self-care.”\[^{1}\]

One [Meaning of health education regarding menstruation] is that “early detection of disorders such as a menstrual disorder is beneficial”\[^{7}\].

3) {Studies on menstruation}

Regarding [Studies on menstruation are behind], “conditions surrounding menstruation have not changed, even though more than 10 years have passed since indications were defined by the Ministry of Health, Labour and Welfare.”\[^{5}\] However, “improvement in menstruation concomitant symptoms due to self-care has been observed according to some studies.”\[^{1}\]

Since [Development of a scale for menstruation is poor], “research on a scale development is needed”\[^{5}\] due to “few new development is needed”\[^{5}\] due to “few new developments in Menstrual Distress Questionnaire (MDQ) and PMS memory”\[^{5}\].

4) {Issues related menstruation}

Regarding [Compensation for the lack of knowledge on menstruation and response] “an appropriate response is not taken due to the lack of knowledge on menstruation and too few places where health consultations are provided.”\[^{22}\] Regarding [Consultation leading to a visit to the gynecologist], among persons who receive a consultation for menstruation in Japan, “80% are mothers,”\[^{5}\] “influenced by the advices of their family.”\[^{5}\] Regarding [Improvement of the negative influence on society], since “menstruation issues influence family, society, and the national economy,”\[^{8,14,22,24}\] improvement is needed.
Menstruation issues influence family, society, and the national economy. Menstrual problems consulted doctors, pharmacists, mothers, sisters, friends.

| Categories | Sub-categories | Main code | Documentation |
|------------|----------------|-----------|---------------|
| Awareness of menstruation | In Japan, menstruation is only treated from the medical perspective, but there are few multifaceted perspectives that include the mental and social aspects. | 1) Yamamoto | |
| | Medical treatment and counseling at a medical institution can promote a change in perception of menstruation and positive coping choices can be more easily made. | 3) Mochizuki | |
| | It is possible not only to accept menstruation, but also think positively about it. Menstruation is a familiar problem and affects QOL. Support through education of knowledge regarding perimenstrual symptoms, and enlightenment / PR activities | 23) Kagawa, Tauchiya, Saito & Terashima | |
| | For perimenstrual symptoms, there is a difference in resilience and seeking support and in the perception of menstruation regarding mental and physical complaints. There is also a difference in knowledge and how to deal with it. | 24) Kagawa, Kitamura, Ninomiya & Terashima | |
| | Through counseling, students with premenstrual symptoms can learn how not to view menstruation negatively, but realize the importance of accepting it, their original worries can be alleviated. | 24) Kagawa, Kitamura, Ninomiya & Terashima | |
| Practice of gynecology examination and diagnosis | Care when interviewing and examining teenage patients is important. If the pelvic examination is traumatic, they may refuse to see the doctor and reject medical treatment. Checking for sexual intercourse and pregnancy, and half of all visits to gynecologists by young women are for menstrual disorders. | 3) Mochizuki | |
| | 85.9% of women in their 20s experience PMS, but awareness of the disease is low and they have not visited a gynecologist because the symptoms go away after menstruation, they are not aware of the disease and do not seek medical attention. | 1) Yamamoto & Ueda | |
| | Screening women with strong premenstrual symptoms can encourage them to seek medical attention and prevent secondary problems. | 24) Kagawa, Kitamura, Ninomiya & Terashima | |
| Support during menstrual period | Young women receive emotional support, but are not given practical support regarding symptom relief and daily living. | 5) Kaimura & Ueda | |
| Education surrounding menstruation | Health education on menstrual disorders that targets female students and their parents, including education on reproductive health, is considered beneficial for early detection of disorders such as menstrual disorder. The use of PMS memory and education on menstruation concomitant symptoms are important. Understanding events even under stressful conditions and positive recognition is important in maintaining and improving health. | 7) Karout, Hawai & Abusalih | |
| Study of menstruation | Studies have clarified that menstruation concomitant symptoms have a major physical and mental affect, but improvement of such symptoms is observed by self-care. | 1) Yamamoto | |
| | Conditions surrounding menstruation have not changed, even though more than 10 years have passed since indications were defined by the Ministry of Health, Labour and Welfare. In the future, a comprehensive view of the physical, mental, and social factors have each been studied, but a comprehensive view of factors and demonstrating how they are interrelated, is needed. Studies of perimenstrual symptoms which focus on the QOL of young women are behind. | 5) Kaimura & Ueda | |
| Development of menstrual scale are tested | MDQ and PMS memory are tools to measure menstruation concomitant symptoms, but they have been modified and used independently, with little new development. Perception of perimenstrual symptoms is subjective, and symptom assessment requires objectification and quantification. Consequently, research for the development of a scale is needed. | 24) Kagawa, Kitamura, Ninomiya & Terashima | |
| Lack of knowledge on menstruation | Menstrual pain is a health issue which is caused by insufficient treatment due to women's lack of knowledge and society's lack of understanding. | 20) Fukuyama | |
| | Due to the lack of knowledge on menstruation and the fact that there are not enough places where health consultations are provided. | 24) Kagawa, Kitamura | |
| Consultations which lead to a medical examination | 90% of consultations for menstruation are by mothers and are influenced by the advice of their family. 11.6% were referred to a gynecologist, 8.8% had endometriosis, adenomyosis, fibroids, and PCOS. Menstrual problems consulted doctors, pharmacists, mothers, sisters, friends. | 5) Kaimura & Ueda | |
| Issues related Menstrual | Menstruation issues influence family, society, and the national economy. | 9) Kaimura & Ueda, 15) Ahmed, Aliza & Nadia | |

<Table 3> Consequences of menstrual disorders in young women

| Sub-categories | Main code | Documentation |
|----------------|-----------|---------------|
| Awareness to accept menstruation | 85.9% of women in their 20s experience PMS, but awareness of the disease is low and they have not visited a gynecologist because the symptoms go away after menstruation, they are not aware of the disease and do not seek medical attention. | 1) Yamamoto & Ueda |
| | Screening women with strong premenstrual symptoms can encourage them to seek medical attention and prevent secondary problems. | 24) Kagawa, Kitamura, Ninomiya & Terashima |
| Practice of gynecology examination and diagnosis | Care when interviewing and examining teenage patients is important. If the pelvic examination is traumatic, they may refuse to see the doctor and reject medical treatment. Checking for sexual intercourse and pregnancy, and half of all visits to gynecologists by young women are for menstrual disorders. | 3) Mochizuki |
| | 85.9% of women in their 20s experience PMS, but awareness of the disease is low and they have not visited a gynecologist because the symptoms go away after menstruation, they are not aware of the disease and do not seek medical attention. | 1) Yamamoto & Ueda |
| | Screening women with strong premenstrual symptoms can encourage them to seek medical attention and prevent secondary problems. | 24) Kagawa, Kitamura, Ninomiya & Terashima |
| Support during menstrual period | Young women receive emotional support, but are not given practical support regarding symptom relief and daily living. | 5) Kaimura & Ueda |
| Education surrounding menstruation | Health education on menstrual disorders that targets female students and their parents, including education on reproductive health, is considered beneficial for early detection of disorders such as menstrual disorder. The use of PMS memory and education on menstruation concomitant symptoms are important. Understanding events even under stressful conditions and positive recognition is important in maintaining and improving health. | 7) Karout, Hawai & Abusalih |
| Study of menstruation | Studies have clarified that menstruation concomitant symptoms have a major physical and mental affect, but improvement of such symptoms is observed by self-care. | 1) Yamamoto |
| | Conditions surrounding menstruation have not changed, even though more than 10 years have passed since indications were defined by the Ministry of Health, Labour and Welfare. In the future, a comprehensive view of the physical, mental, and social factors have each been studied, but a comprehensive view of factors and demonstrating how they are interrelated, is needed. Studies of perimenstrual symptoms which focus on the QOL of young women are behind. | 5) Kaimura & Ueda |
| Development of menstrual scale are tested | MDQ and PMS memory are tools to measure menstruation concomitant symptoms, but they have been modified and used independently, with little new development. Perception of perimenstrual symptoms is subjective, and symptom assessment requires objectification and quantification. Consequently, research for the development of a scale is needed. | 24) Kagawa, Kitamura, Ninomiya & Terashima |
| Lack of knowledge on menstruation | Menstrual pain is a health issue which is caused by insufficient treatment due to women's lack of knowledge and society's lack of understanding. | 20) Fukuyama |
| | Due to the lack of knowledge on menstruation and the fact that there are not enough places where health consultations are provided. | 24) Kagawa, Kitamura |
| Consultations which lead to a medical examination | 90% of consultations for menstruation are by mothers and are influenced by the advice of their family. 11.6% were referred to a gynecologist, 8.8% had endometriosis, adenomyosis, fibroids, and PCOS. Menstrual problems consulted doctors, pharmacists, mothers, sisters, friends. | 5) Kaimura & Ueda |
| | Menstrual problems consulted doctors, pharmacists, mothers, sisters, friends. | 15) Ahmed, Aliza & Nadia |
| Issues related Menstrual | Menstruation issues influence family, society, and the national economy. | 9) Kaimura & Ueda, 15) Ahmed, Aliza & Nadia |
1. Attributes of menstrual disorders in young women

The concept of menstrual disorders in young women was defined as “in actual conditions of menstrual disorders, there is great variation, such as dysmenorrhea, PMS, irregular menstruation, and accordingly, related risks have been observed, and the existence of endometriosis is also partially indicated. Analgesics and OC are not appropriately utilized, and QOL of young women during menstrual period decreases.”

2. Background of menstrual disorders in young women

1) Young women’s lifestyle and change in life habits

One precondition, [Women’s lifestyle and changes in life habits], is significant as background. Over the past 30 years, women’s lifestyles in Japan have greatly changed. As popularization of higher education, advances in society, trends in decreased birthrate due marrying and having children later in life, have continued, the average age for a women’s first birth was over 30 years. Total fertility rate in 2020 was 1.34, and continues to fall. Consequently, after World War 2, the frequency of menstruation has significantly increased, and more women experience dysmenorrhea.1)

Furthermore, life habits of young women have also greatly changed. “the number of women 20-29 years with a low body weight has increased, twice that of 30 years ago” as represented by the [desire to lose weight].5,25 Dieting causes the menstrual cycle to become irregular, and the weight loss eventually leads to amenorrhea. For persons who have dieted in the past, even if amenorrhea is treated and the menstrual cycle returns to normal, strong menstrual pain often remains.26

Sleeping habits have also changed due to the spread of the Internet, and the number of persons who go to sleep after 2 am has increased. The proportion of women in their 20s who miss breakfast is 28.6%. Exercise habits are few, and the number of women who partake in luxury items such as smoking and alcohol, have increased, as the number of working women has increased.22 Since “diet restrictions which are disassociated with diurnal rhythms have a synergistic negative effect on reproductive functions”25, menstrual disorders can easily occur in the daily lives of young women in the modern generation.

2) Negative view of menstruation and lack of education on menstruation

“A negative the view of menstruation as ‘troublesome’ is strong, and the younger the person is, the more negative the view of menstruation is.”21 “A negative reaction to the person’s first menstruation affects the formation of a negative view of menstruation.”5,22

In Japan, menstruation education is provided for all elementary school students, but “33.3% are dissatisfied with the education because it is insufficient.”5 Since “24% of junior high and high school students have some knowledge of the menstruation mechanism, a
lack of knowledge regarding menstruation is indicated,”5) and consideration of the contents of the menstruation education is needed.

3. Issues in menstruation education and research surrounding young women

In Japan, “80% of consultations for menstruation are by mothers,” “influenced by the advice of their family.”5) Overseas however, “43.7% consult with a physician.”10)

Regarding [Actual condition of visiting a gynecologist] in Japan, “85.9% of women in their 20s experience PMS, but awareness of the disease is low and they have not visited a gynecologist because the symptoms go away after menstruation.”11) The rate of young women visiting a gynecologist is low. Although “they experience menstrual pain - omission - an appropriate response is not taken due too few places where health consultations are provided.”22) Consequently, an environment where “consultations which lead to the action of visiting a gynecologist,” are needed.

Regarding [Support during menstrual period], since “information support which connects to practical self-care, such as symptom alleviation and ideas in daily life are few,”5) “health education on menstrual disorders that targets female students and their parents, including education on reproductive health, in the school curriculum is considered beneficial for early detection of disorders such as menstrual disorder.”7) Similarly, [improvement in the negative effect to society] by [a compensatory response to the lack of knowledge on menstruation].

While [research on menstruation is behind] is currently observed, “studies have clarified that menstruation concomitant symptoms have a major physical and mental effect, but improvement of such symptoms is observed by self-care.”11) Consequently, consideration of menstruation education to help young women perform self-care is needed.

[Development of a scale for menstruation is poor] is observed, and MDQ and PMS memory, etc. are scales developed in 1900s. Study on the development of a new scale for menstruation which considers the background of modern young women is important in the future.

VI. Conclusion

The concept of menstrual disorders in young women was defined as “in actual conditions of menstrual disorders. There is great variation, such as dysmenorrhea, PMS, irregular menstruation, and accordingly, related risks have been observed, and the existence of endometriosis is also partially indicated. Analgesics and OC are not appropriately utilized, and QOL of young women during menstrual period decreases.” Consideration of the background of modern young women who easily experience menstrual disorders, and promotion of better menstruation education are important.
VII. Limitations and future asks of this study

One limitation of this study is that analysis on the use of terms is based on a limited number of articles. The possibility of bias in article extraction can be mentioned.

Moreover, menstrual disorders in young women are individualized, therefore individual factors which can influence the process of developing a menstrual disorder are thought to exist. In the future, the refinement of the concept is needed, and verification in practice with young women are needed.

This study adds to and revises the contents presented at the 62nd Academic Conference of the Japan Society of Maternal Health.

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