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REVIEW ARTICLE

Characteristics of Menstrual Health Issues of Working Women in Japan

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ABSTRACT

Purpose: This study aimed to review previous studies published in Japan on menstruation among working women and clarify the trends and characteristics of their health issues.

Method: A search for original articles published between 2012 and 2023 was conducted using ICHUSHI and CiNii, and 21 studies meeting our objectives were included in the analysis. The 21 articles were sorted by publication year, study design, subjects' characteristics, and subjects' age. Research trends and health issues related to menstruation among working women were then extracted and classified based on their similarities.

Results: Factors that triggered the onset of menstrual symptoms included age, night shift work, and stress. The negative effects of menstruation on employment involved inaccurate and inefficient work. Other issues found were the low utilization of social systems, such as menstrual leave, and lack of awareness among male managers. Relatively few women practiced self-care for their menstrual symptoms. Factors associated with lack of self-care included mild menstrual bleeding, menstrual symptoms, desire to avoid work interruption, and lack of awareness.

Conclusion: Education about menstruation should be provided regardless of gender, and support is needed to make self-care routine, even before menstruation begins.

Keywords: Working women, Menstruation, Health issues, Literature review

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1. Introduction

There are 27.18 million working women in Japan, accounting for approximately 50% of the total labor force, and this number is growing¹⁾. Japan's labor policy aims to promote women's employment, increase the proportion of women in management positions, and eliminate the gender gap; the number of working women is thus expected to continue increasing. Working women are also more likely to experience health problems associated with their menstrual cycles; a reported 70–80% of women in their 20s and 30s have menstrual problems, while 64.2% of women in their 20s and 51.8% of women in their 30s have menstrual pain²⁾. These health problems among working women are one of the causes of leave or retirement, evidenced by the fact that 15.8% of working women have taken time off work or quit their jobs due to “menstrual symptoms or disorders,” while 13.3% have done so due to “premenstrual syndrome (PMS)”³⁾. Health issues among working women also contribute to labor loss. The annual social burden of menstrual symptoms (abdominal pain, back pain, drowsiness, irritability, constipation, etc.) for working women is 682.8 billion yen, and the loss due to their absenteeism and decline in the quantity and quality of work is 491.1 billion yen⁴⁾.

Fluctuations in female hormones result in various health problems for women, such as menstrual abnormalities, reproductive organ disorders, and mental health issues, which are quite different from the experiences of men. In addition, Japanese women tend to experience an increase in the number of menstrual periods during their lifetime due to later marriages, older childbearing ages, and fewer childbirths, and it is essential for working women to deal with menstrual disorders. There are also reports that menstrual symptoms are decreasing the quality of life of working women⁵⁾. As a measure to reduce the impact of these health issues on working women, Japan's Ministry of Economy, Trade and Industry (METI) is promoting FemTech (a word derived from “female” and “technology”; products and services that use technology to solve health issues faced by women). Thus, supporting women's health issues caused by fluctuations in female hormones, such as during menstruation, is an urgent need in order for women to play an active role in society.

“Health care and welfare” is currently Japan's largest and fastest growing occupation, compared to other industries, employing 6.4 million women⁶⁾. Considering the health of working women in Japan, we plan to create a health support program for working women involved in this industry. This study aims to review research articles published in Japan related to menstruation among working women to identify trends and characteristics of the related health issues. This can then be used as basic data in planning the content of a health support program.

2. Methods

2.1. Literature retrieval

Bibliographic databases used for the literature survey were the Central Journal of Medical Science Web Edition Ver. 5 (ICHUSHI) and CiNii. These two databases were used to ensure good coverage of Japanese medical and nursing papers. The selection criterion was “health issues related to menstruation among working women in Japan” are described. The search conditions were original articles published between January 2012 and April 2023, the search was limited to titles and abstracts, and the keywords were “working women” AND “health,” AND “menstruation,” OR “menopause.” The search results were verified by three independent researchers. The exclusion criteria were “not for women in Japan,” “for occupations that involve working outside the workplace,” and “without new knowledge about the actual situation of working women,” such as literature reviews and scale development articles.

2.2. Analysis Method

The selected articles were classified by year of publication, study design, and study subjects and their age group. From these, we identified research trends related to menstruating working women, as well as the health issues they faced. The extracted health issues were inductively classified in terms of their similarities and differences.

In all analyses, the use of the literature was limited to the scope of this study, and copyright was respected.

3. Results

A total of 26 original articles were selected, including one article found manually. Of these, two reports of “studies that did not focus on Japanese women,” one report of “studies on forms of work outside the workplace such as telework,” which is rare in medical employment, one report of “studies on scale creation,” and one literature study were excluded, leaving 21 articles for analysis.

The numbers in parentheses in the following text correspond to the article numbers listed in Table 1.

Table 1 : List of References

No	Author Name	Publish year	Research Design	Analysis Method	Main Results	Subject (of taxation, etc.)
1	Michiko Kaminura	2022	Cross-sectional observational study	Basic Statistics χ^2 Test Mann-Whitney Test Kruskal-Wallis Test Multiple Regression Analysis	It was suggested that nurses in the AYA generation are more likely to have irregular menstrual cycles and more menstrual cramps. In addition, 90% of them had decreased work performance during the perimenstrual period. Health problems associated with the menstrual cycle that affected work performance during the perimenstrual period were "behavioral changes" and "pain" in the menstrual-associated symptoms and heavy menstrual bleeding, which decreased the nurses' work performance.	420 female nurses aged 20-40
2	Natsuo Sasaki, Kamami Tsuno, Yui Hiddaka, et al.	2021	Cross-sectional observational study	Basic Statistics χ^2 Test	The percentages of those with symptoms that interfered with their ability to work were: physical symptoms (89%), menstrual problems (65%), and psychological symptoms (49%). Support utilization rates were: flextime and telework (1.3%), menstrual leave (4%), and shorter work-hour programs (8%). There was a significant association between having menstrual problems and work-life balance issues and expecting them to be studied, but the percentage of symptomatic respondents who expected an intervention was 48% in all cases.	416 female workers
3	Naoe Ubukata, Tomoko Yukita, Yukiko Miyazaki	2021	Cross-sectional observational study	Basic statistics t-test	The mean of the total MDQ score was almost the same before and during menstruation and was lowest after menstruation. In terms of the relationship between self-care and MDQ, significant differences were found in items such as "consideration for cold" and "keeping the body warm" in all menstrual cycles. The number of respondents who felt the effects of these self-care practices ranged from 60 to 90%.	1,092 working women aged 20-45
4	Kiyomi Konishi, Kazue Meijo, Eriko Nagamine, et al.	2021	Cross-sectional observational study	Simple aggregation Content analysis	Regarding the inclusion of menstrual status in the incident report, 176 (32.6%) of the respondents answered "good," and 61 (11.3%) answered "not good." The reasons were: want to know the relationship between menstruation and incidents, influence on work if menstrual symptoms are intense, improve the work environment, privacy concerns, do not want to use menstruation as a reason, and no measures. The percentage of nurses who took menstrual leave was 19 (3.5%).	548 female nurses aged 20-39
5	Hideo Kimura, Sechi Azuma	2021	Cross-sectional observational study	Simple aggregate	The most common complaint was cold (31 cases), followed by constipation (16 cases), edema (15 cases), anxiety/irritability (12 cases), and irregular menstruation (11 cases).	53 working women aged 20-39 years who visited a Chinese medicine clinic
6	Chihiro Yamaki, Yoko Tokiwa, Miyoshi Yoshizawa, et al.	2020	Cross-sectional observational study	χ^2 test t-test	Several factors were associated with self-care: the amount of menstrual blood loss, the degree of menstrual complications, whether or not self-care interfered with work, awareness of self-care, and knowledge of menstrual complications and self-care. More than 30% of the respondents reported that their menstrual symptoms interfered with their ability to work. Even among nurses, knowledge was related to whether or not self-care was practiced.	456 female nurses under 50 years old
7	Miyuki Kanemune, Mami Takahashi	2019	Cross-sectional observational study	Basic Statistics Correlation of all variables Multiple Regression Analysis Covariance Structure Analysis	Menopausal symptoms had a significant negative correlation ($r=-.471, p<.01$) with "overall sense of health." Among menopausal symptoms, psychological symptoms were significantly negatively correlated with HP behavior ($r=-.306, p<.01$) and self-efficacy ($r=-.413, p<.01$). Direct influences on menopausal symptoms were self-efficacy and SF-8; Mental Summary Score. The most significant direct influence reinforcing menopausal symptoms was "health status," while "self-efficacy" suppressed menopausal symptoms.	1,201 female nursing workers aged 40-59
8	Junko Mogi, Takahiko Kawamura, Takuya Nakayama, et al.	2019	Cross-sectional observational study	X2 test t-test Mann-Whitney U test Pearson's rank correlation multiple regression analysis	Compared to premenopausal women, post-menopausal women had significantly higher age, LDL-C, HDL-C, adiponectin, HbA1c, 8OHdAG, vitamin D3, and lower IGF-1, lean body mass, and leg muscle mass. In terms of lifestyle, post-menopausal women were more likely to report that they "have an exercise habit" and "walk faster than others of the same age." Post-menopausal women who answered that they walked faster were more physically active and had greater muscle strength. The results suggest that even if muscle mass decreases after menopause, muscle mass may be maintained through lifestyle habits that increase physical activity.	83 hospital-employed women aged 41-64

No	Author Name	Publish year	Research Design	Analysis Method	Main Results	Subject (of taxation, etc.)
9	Fumihisa Mlyuchi, Naoko Ohzumi, Hideyuki Kagawa, et al.	2018	Longitudinal study	Basic statistics t-test χ^2 test	Two years later, complaints about menopause and infertility increased significantly. Two years later, significantly more women visited a medical institution complaining of "menstrual cramps and excessive menstruation." Two years later, there was a significant increase in "slight disruption of usual work due to physical reasons." These findings may result from the stressful working environment in the medical field and age-related changes.	4,748 women working in hospitals
10	Eriko Suringa	2018	Cross-sectional observational study	Descriptive Statistics χ^2 test Kruskal Wallis test Steel-dwass test	In relation to symptoms, age, coping behaviors, and occupational stress, "depressed/ hopeless mood," "anxious/ nervous," "tearful/sad," and "easily tired/ low energy" were high among mental symptoms among those aged 25-34. Regarding self-care learning needs, those who did not want to learn coping skills also accounted for more than 69%. In the relationship between coping behavior and symptoms, those who "do" cope had significantly higher scores for all mental, physical, and social dysfunctional symptoms than those who "do not" cope. Women with coping behavior and the high occupational stress group had significantly higher scores for mental symptoms, physical symptoms, and social impairment.	362 working women aged 20-40
11	Mami Hagiwara, Akiko Mori	2018	Cross-sectional observational study	Basic Statistics Factor Analysis One-Way ANOVA	Fluid retention pain was the highest in the premenstrual, middle, and late stages, followed by instability of emotions, behavior, thoughts, autonomic nervous system disturbances, and positive emotions. Three factors were extracted for impediments to nursing work: restlessness and inaccuracy, decreased ability to control emotions and decreased work efficiency due to physical symptoms. About 40% of the respondents did not actually do their work even though they wanted to change their work or adjust their workload due to painful menstrual symptoms. Many of them pushed through their symptoms and continued to work. The reasons for this were "difficulty in taking time off work," "difficulty in going to the restroom," "difficulty in expressing their pain to others," and "lack of understanding by others."	646 female nurses
12	Fumihisa Mlyuchi, Naoko Ohzumi, Hideyuki Kagawa, et al.	2018	Cross-sectional observational study	Basic Statistics χ^2 Test	Menstrual-related symptoms were the most common reason for consultation, and there was no difference between the working and housewife groups. Working women had more menstrual-related symptoms than homemakers and had various subjective symptoms. Working women were more likely to visit the outpatient clinic with more severe symptoms.	232 women diagnosed with uterine fibroids (184 employed, 48 unemployed)
13	Fumihisa Mlyuchi, Naoko Ohzumi, Hideyuki Kagawa, et al.	2018	Cross-sectional observational study	Basic Statistics t-test χ^2 Test	Menstruation-related symptoms were significantly higher in the group with night work than in the group without night work. The proportion of respondents with no night work was 19.9%, which was significantly lower than that of the group without night work (27.1%). Significantly more respondents with night work reported that "pain sometimes interferes with daily life" than those without night work, while significantly fewer respondents reported that "I have pain, but can perform daily life normally." The proportion of nurses who used analgesics for menstruation was 64.6% in the group with night shifts, which was significantly higher than that of the group without night shifts (54.5%).	3573 nurses (2500 with night shift, 1073 with day shift only)
14	Shion Higuchi	2018	Cross-sectional observational study	Grounded theory approach	Five categories were generated: Distress due to menstruation, Distress intensified by work, Normative consciousness as a member of society, Conflicts in control, and Postmenstrual emotions.	13 working women (23-25 years old) in their first to third year of employment
15	Shinkichi Igarashi	2018	Cross-sectional observational study	Basic statistics t-test χ^2 test	Irregular menstruation was significantly more common in the education and medical groups in their 30s, and menstrual cramps were significantly more common in the medical group in their 40s. Menopausal symptoms were significantly more frequent among manufacturing and office workers. Endometrial thickness was significantly higher in the medical group. Abnormality was significantly higher in manufacturing and office workers.	Gynecological checkups under 49 years of age 518 (84 medical, 119 clerical, 126 manufacturing, 73 education, 116 non-working)

No	Author Name	Publish year	Research Design	Analysis Method	Main Results	Subject (of taxation, etc.)
16	Fumihisa Miyauchi, Naoko Ohzumi, Hideoyuki Kagawa, et al.	2017	Cross-sectional observational study	Basic Statistics χ^2 Test	Female managers were more knowledgeable about women-specific diseases than male managers. Male managers were significantly less knowledgeable than female managers regarding the question, "Are there people in your workplace who are being treated for women's diseases or menopausal disorders?" Male managers were significantly less knowledgeable than female managers regarding the question, "Do you give consideration to subordinates with female-specific illnesses?" Male managers selected "Yes" at one-fifth the rate of female managers.	1028 middle managers (796 men, 232 women)
17	Nishikitani Mariko, Nakao Mutsuhiko, Tsurugano Shinobu, et al.	2017	Cross-sectional observational study	Basic Statistics χ^2 Test Wilcoxon Rank Sum Test Multiple Logistic Regression Analysis	There was no significant relationship between symptoms of dysmenorrhea and decreased work efficiency. An association was found between shorter time between the end of work and resumption of work the next day, health concerns and health complaints, and abnormal menstrual cycles.	505 working women aged 23-43
18	Fumika Kimura, Ayumi Echigo, Hiroyasu Iwatsuki	2017	Cross-sectional observational study	Basic Statistics χ^2 Test	There was a significant difference in the presence or absence of back pain between the normal and irregular menstrual groups, with the irregular menstrual group having more back pain.	139 women working in nursing homes
19	Fumihisa Miyauchi, Naoko Ohzumi, Hideoyuki Kagawa, et al.	2016	Cross-sectional observational study	Basic statistics t-test χ^2 test	Compared to homemakers, working women tend to undergo surgery earlier for ovarian endometriosis but later for cervical cancer. Compared to homemakers, working women had significantly more post-discharge anxiety.	27,535 women who underwent surgery for gynecological diseases in the past 20 years
20	Eriko Shunga	2016	Quantitative descriptive study	Basic Statistics χ^2 test Wilcoxon's rank sum test Spearman's correlation coefficient	In total, 31.9% of the respondents were taking some measures to alleviate menstrual symptoms. 45.1% of the group with moderate to severe menstrual symptoms did not engage in self-care despite the severity of their symptoms. The top coping methods were "sleep," "lying down," and "warm compress." The most common reason for not coping in both groups was "not being able to take leave from work," followed by "it is a hassle to do something." The occupational stressors "work quantity burden," "work quality burden," and "interpersonal relationships at work," the modifiers "support from coworkers," and the stress reactions "irritability," "fatigue," "anxiety," "depression," and "physical complaints" were significantly more stressful in the medium and severe groups.	345 working women in regular employment aged 20-40
21	Yumiko Sakuma, Seiko Miyauchi, Akiyo Sasaki, et al.	2014	Cross-sectional observational study	Basic Statistics t-test Mann-Whitney-U test Analysis of variance Friedman test	In terms of menstrual symptoms, "constipation" was significantly decreased in the yoga group after eight weeks. Psychological indicators showed that after eight weeks, the yoga group significantly increased "Mood Decline" and "Physical Disease." The results of the survey were significantly improved.	19 working women with menstruation

3.1. Research trend (year of publication, study design, and study subjects and their age groups)

The most common reporting year was 2018, with seven articles; followed by 2021, with four; 2017 with three; 2019 and 2016 with two each; and finally, 2022, 2020, and 2014, with one each. With regard to the study design, there were 20 cross-sectional observational studies and one longitudinal study. The composition of study subjects' occupations included six nursing, three hospital/nursing home staff, and 12 unspecified. Their age was unspecified in nine cases, 23–25 years in one case, 20–39 years in three cases, 20–40 years in two cases, 23–43 years in one case, 20–45 years in two cases, 40–59 years in one case, 49 years or younger in one case, and 50 years or younger in one case.

3.2. Health issues related to menstruation among working women

The extracted health issues were classified into “impact on physical, psychological, or employment conditions” and “health behaviors related to menstruation.”

3.2.1. Impact on physical, psychological, or employment conditions

The impact of health issues on women's physical, psychological, or employment conditions was broadly divided into “Factors related to the onset of menstrual symptoms” and “Effects of menstruation on employment.”

3.2.1.1. Factors associated with the onset of menstrual symptoms

Factors influencing the onset of menstrual symptoms were mainly menstrual cycle (3, 11), age (1, 9, 15), occupation (15, 18), work pattern (day/night shift), and working hours (13, 17). Meanwhile, the degree of stress (20) was found to be a factor affecting the development of premenstrual syndrome, while menopausal symptoms were reported in two articles (7, 8).

Menstrual status included reports of concomitant symptoms and menstrual cycle irregularities. Across all menstrual periods, physical discomfort due to fluid retention/pain was the most common, followed by emotional, behavioral, and/or thought instability and autonomic nervous system dysfunction (11). The severity of menstrual symptoms was the same before and during menstruation and was mildest after menstruation. Working women who were stressed at work had more severe menstrual symptoms in all menstrual periods compared to those who were not stressed (3).

In terms of age, 29.5% of nurses younger than 40 years reported irregular menstrual cycles, and 20.1% reported heavy menstrual bleeding (1). Ninety percent of nurses reported that their performance was impaired by pain, other menstrual complications, and heavy bleeding. Among them, nurses in their 20s had more menstrual complications and irregular menstrual cycles (1).

Over a two-year study on the health status of women working in hospitals, the number of women visiting medical facilities due to “menstrual cramps and excessive menstruation” saw a significant increase at the end of the two years (9). Similarly, complaints about menopause and infertility also increased significantly, which was thought to be due to stress in addition to older age (9).

In terms of occupation, irregular menstruation was significantly more common among those in their 30s in the educational and medical professions, and menstrual cramps were significantly more common among those in their 40s in the medical profession (15). Abnormal endometrial thickness was significantly higher among medical, manufacturing, and office workers (15), while menopause was significantly more common among manufacturing and office workers (15).

Irregular menstruation was associated with lower back pain, which was significantly more common in the irregular menstruation group among women in medical care occupations (18).

In terms of work type and working hours, nurses who worked night shifts had significantly higher levels of menstrual pain and irregular menstrual cycles as well as menstrual-related symptoms, including pain, excessive menstruation, irregular menstruation, midterm pain, premenstrual dysphoric disorder, and irregular bleeding, compared to nurses who only worked day shifts (13). In terms of analgesic use, nurses who worked night shifts used analgesics more frequently than those who worked only day shifts (13). In terms of working hours, there were no significant differences between shorter working intervals and their effects on menstrual cycle abnormalities, dysmenorrhea, or work efficiency due to various menstrual symptoms (17). However, women with shorter work intervals had higher levels of health concerns and dissatisfaction and were more concerned about the impact on their future menstruation (17).

For premenstrual syndrome, stressors and reactions are more common in the moderate and severe groups than in the mild group (20).

Nurses in the late stages of their careers, aged 40–59 years, had a significant negative correlation between “overall sense of health” and menopausal symptoms. Among menopausal symptoms, psychological symptoms had a significant negative correlation with health promotion behaviors and self-efficacy (7). Working women in the transition to menopause tended to have unhealthier lifestyle habits and a higher menopausal index (8).

3.2.1.2. Effect of Menstruation on Employment

The effects of menstruation on employment include interference with work (6, 9,14), such as stress and reduced efficiency (4, 9, 11, 20), as well as the use of social systems (2, 4, 11), supervisor perceptions of menstruation and female genital disorders (16), and expectations of the workplace (2).

Many working women experience menstrual symptoms that interfere with their ability to work (6). Another factor affecting presentism among working women is premenstrual syndrome (6). Women with premenstrual symptoms feel flawed and inefficient at work during the period around menstruation (6, 11). Simultaneously, many women are unable to control their emotions or ignore their symptoms and go to work (6, 11). Women working in the medical field were found to have a slightly impaired health status due to their work. (9). This may result from stressful working environments in the medical field and age-related changes (9). Moreover, “distress caused by menstruation itself” evolved into “distress intensified by work” as a process of the obstacles to work caused by menstruation, while working women’s “sense of norms as a member of society” caused “conflicts in control” leading to “postmenstrual feelings (calmness of mind, anxiety about the next menstrual period)” (14). Their “normative consciousness as a member of society” included “I should behave in the same way,” “I should have a sense of responsibility at work,” and “I should not bring menstruation into my work” (14).

In the relationship between stress and the degree of premenstrual syndrome in working women, “work quantity burden,” “work quality burden,” and “interpersonal relationships at work” were stressors for women with moderate or severe premenstrual syndrome (20), while stress responses included “irritability,” “fatigue,” “anxiety,” “depression,” and “physical complaints” (20). Additionally, obstacles to nursing work due to menstruation included restlessness and inaccuracy, decreased ability to control emotions, and decreased work efficiency due to physical symptoms (11).

On the other hand, when working women were asked whether or not menstrual status should be included in the incident

report, the most common response was “don’t know” (4), with the reasons being “privacy cannot be protected,” and “menstruation should not be a reason for error” (4).

Regarding the use of social systems by working women, approximately 40% did not actually use them, even if they wanted to change their work or adjust their workload because of painful menstrual symptoms (11). The rate of menstrual leave use was also low (2, 4), stemming from “not knowing about the system itself,” “not knowing if it exists in the workplace,” and “it does not exist in the workplace” (4). However, more than half of the respondents wanted to take menstrual leave (4).

According to the data, menstrual pain (54.8%) was relatively well-known to male managers among menstruation-related symptoms (excessive menstruation, frequent menstruation, menstrual cramps, dysmenorrhea, and premenstrual syndrome), but only some 10% were aware of other symptoms (16).

Working women, however, wanted workplaces to conduct research “to alleviate shoulder and back pain” (45%), “to improve women’s mental health” (41%), and “research on menstruation and job performance” (35%) (2). While there was a significant association between experiencing such menstrual problems and expectations for relevant research, less than half of the women suffering from menstrual symptoms expected an intervention from their workplace (2).

3.2.2. Health behaviors related to menstruation

Health behaviors related to menstruation among working women were divided into two main categories: menstruation-related self-care and learning needs related to female hormones.

3.2.2.1. Self-care regarding menstruation

Self-care related to menstruation among working women included self-care frequency (19, 21), factors related to self-care practices (3, 6, 10), content of self-care (3, 4, 6, 19, 21), activities of daily living and their impact on health (8), and health-seeking behaviors (5, 12, 19).

Few working women practiced self-care for their menstrual symptoms (6, 21), with the reasons being “I can’t take leave from work” and “It’s a hassle to do something” (21). Additionally, multiple factors were related to the implementation of self-care, including the amount of menstrual blood loss, the degree of menstrual complications, whether or not self-care interfered with work, awareness of self-care, and knowledge of menstrual complications (6). The degree of symptom awareness also influenced self-care implementation (3, 10). However, nearly half the respondents did not practice self-care even when their premenstrual syndrome symptoms were moderate to severe (20).

The self-care activities included “taking care of myself when it is cold,” “keeping the body warm,” “sleeping more hours, taking naps,” “lying down,” and “using painkillers” (3, 19), which was the most effective self-care activity (3, 6). Another self-care behavior was visiting a Chinese medicine doctor for irregular menstruation (4). Simple yoga was found effective in improving flexibility, physical and mental discomfort, and menstrual symptoms and fatigue among working women, with a significant decrease in “constipation” among the yoga group after eight weeks, together with a decrease in “mood swings” and “physical discomfort” (21).

Regarding the influence of daily lifestyle and health among working women, post-menopausal women tended to be more physically active and have higher muscle strength than those who perceived their own walking speed to be fast (8), suggesting that muscle strength may be maintained even after menopause through a lifestyle that increases physically. It

means measures against activities in cold weather (8).

Working women had various subjective symptoms, including menstruation-related symptoms, at the time of their first clinic visit (12). While working women refrained from seeing a doctor until the last minute, homemakers tended to see a doctor earlier (12). However, as noted above, some working women visited Chinese medicine clinics for irregular menstruation (5).

3.2.2.2. Learning needs related to menstruation

Learning needs regarding menstruation among working women were reported as those related to self-care (4, 10, 20). Although nearly 70% of working women did not perceive the need to learn to cope with menstruation (4, 10), women who were not coping had significantly higher learning needs related to self-care than those who were (10). “Aromatherapy,” “autonomous training methods,” and “imagery methods” were the top desired learning content, and “Internet” was the preferred learning method, indicating a need for web-based learning content and programs (20). Meanwhile, a survey of nurses found learning “about the relationship between menstrual periods and human error” and “self-care for menstrual symptoms” to be their desired healthcare measures related to menstrual complications (4).

4. Discussion

This study aimed to analyze the domestic literature on menstruation among working women and identify research trends and health issues to produce relevant content and methods of health support for these women.

4.1. Characteristics of menstruation-related health status of working women

Factors associated with the occurrence of menstrual complications among working women were menstrual period, age, occupation, and type of work. All the time periods of premenstrual, menstrual, and postmenstrual periods presented with menstrual-related symptoms such as instability in emotional behavior and thinking, in addition to physical distress such as back pain and fluid retention^{7,8}). Some working women worked irregular shifts, including night shifts, and their menstrual-associated symptoms were significantly higher⁹), indicating that irregular work patterns affect their menstrual health. In a previous study, shift work also affected menstrual symptoms^{10,11}), similar to the present results. There were also reports that job stress affects the menstrual cycle¹²) and that irregular menstruation is significantly more common¹³) in women working in pink-collar occupations, but none of these were found in Japan with reference to job type. It was also reported that women younger than 21 have more absenteeism due to menstruation¹⁴), but no study was found in Japan that referred to age-related coping behavior. It can be inferred that the women felt menstruation should not be brought into their work even when menstrual symptoms appear¹⁵), and they hence continued to work.

At the same time, working women experience a decline in their work performance associated with menstrual symptoms^{8,16,17}), and are unable to control their emotions^{16,17}); there are concerns that continuing to work in such instances could lead to serious work-related errors and damage women’s health. In total, 80% of women are reported to have presenteeism during menstruation¹⁴), and it was suggested that there is concern that the women’s health may be compromised. In addition, the annual social burden caused by menstrual symptoms (abdominal pain, back pain, sleepiness, irritability, constipation, etc.) among working women exceeds 600 billion yen, and the loss of work due to decreased work quantity and quality, as well as absenteeism, is nearly 500 billion yen⁴). It is, therefore, clear that unless the health issues

of working women are urgently addressed, Japan's socioeconomic loss will be immeasurable.

One of the measures to address these issues is self-care. Self-care is the first step in dealing with menstrual-related symptoms¹⁸). However, the most utilized method to alleviate menstrual cramps and menstrual complications was found to be the "use of painkillers^{7,17}), whereas self-care behaviors such as "keeping warm," "stretching," and "getting enough sleep" were not frequent^{17,19}). Self-care behaviors were more prevalent among those with more pronounced menstrual symptoms¹¹). According to our analysis, factors preventing working women from practicing self-care included perceptions that "there is nothing to do," "we just have to get along," "we just have to give up," or "we just have to put up with it"²⁰). It was also observed that factors preventing the implementation of self-care are influenced by the working environment and women's own perceptions, such as "I can't take leave from work," and "It's a hassle to do something"¹²). Supporting women to adopt self-care as part of their daily routine during the premenstrual period, before the onset of distress associated with menstrual symptoms, such as warming and stretching, and creating a working environment that allows them to accept the discomfort associated with menstrual symptoms and adjust their work schedules, including taking leave, will therefore positively impact women's well-being. In addition, a previous study that verified the effectiveness of an application that can predict menstrual cycles and has various information provision functions reported significantly less deterioration in the mental state and menstrual difficulties of working women²¹). We believe that self-care using such a tool could be considered.

This analysis revealed that working women do not encourage their workplaces to include various support systems, such as menstrual leave, and do not actively seek learning opportunities. This may be due in part to the low percentage of Japanese women requesting menstrual leave (0.9%)⁵), the influence of women's perception of menstruation, and the fact that the percentage of establishments offering "paid" wages during menstrual leave is not high (29.0%)⁵), and the fact that women are not willing to use social systems, feel a decrease in work efficiency, and work while absent from their jobs. This may also be²²) a factor. Although menstruation is no longer viewed as impure, opinions are still split between "hiding" and "not hiding"²³). The perception of women's menstruation is not a problem only in Japan. For example, Schoep et al.¹⁴) reported that 20% of workers in the Netherlands who were absent from work because of menstruation were honest about the reason for their absence.

Since menstruation itself is a natural and healthy activity, there is resistance to medical treatment for its symptoms, and since it is a problem unique to and varying amongst women, there are difficulties in gaining adequate understanding²⁴). Additionally, approximately 40% of women are unable to tell others about their menstruation²⁵), and women experience more occupational stress than men²⁶), which is a factor in the appearance of menstrual symptoms. Therefore, education on menstruation is necessary to change workplace culture, including understanding menstrual symptoms. It is particularly important to underline that menstruation is a natural and healthy activity and should not be regarded as a private issue for women. In a survey of caregivers, Chou et al.²⁷) found that the way caregivers perceive menstruation is different from that of their patients and that the way they perceive menstruation is different from that of their patients. Chou et al. pointed out in their survey of caregivers that how caregivers perceive menstruation affects how they deal with menstruation, and how they perceive menstruation has an impact not only on women but also on the subjects they encounter at their workplaces. It has also been reported that how women perceive menstruation also affects their well-being²⁸), and thus has an impact on women's lives prior to employment. It is important to work on changing women's awareness of menstruation as soon as possible. Therefore, education on menstruation is necessary for changing the workplace culture, including understanding menstrual symptoms, the fact that menstruation is a natural and healthy activity, and that menstruation should not be

regarded as a private issue for women, regardless of gender.

Gynecological consultation behavior among Japanese women is 55% lower than in Western countries²⁹). Working women improving their health at sexual maturity will determine their well-being for 30-40 years after menopause. However, women's reluctance to publicly disclose their menstruation also leads to delays in hospital visits³), which can lead to further health problems. Despite efforts to improve women's health, such as the establishment of the Office of Women's Health Promotion Health Care Lab³⁰), preconception care, and other programs³¹), specific health support initiatives have not yet been implemented, and health support has not been evaluated. One key aspect to be investigated is encouraging women to recognize their own health and educating men and women about issues specific to women to improve the health of working women from the stage of sexual maturity.

4.2. Research Issues Related to Menstruation in Working Women

Four research issues related to menstruation among working women were identified.

First, there was only one intervention program for self-care, and the factors preventing its implementation have not yet been thoroughly examined. Menstruation education for middle and high school students requires interventions aimed at behavior change³²), and there is a perception among working women in their first to third year of work that they should behave in the same way, be responsible for their work, and should not bring menstruation into their work³³). Thus, this study suggests the importance of support for self-care that can be implemented by youths themselves prior to employment, while the perception of menstruation and menopause among women needs to be examined. Specifically, support focusing on health literacy is needed, as it has been reported that working women with higher health literacy experience significantly less presenteeism during premenstrual syndrome³⁴). Formulating and implementing education aimed at behavioral change is necessary so that working women are aware and can implement self-care to improve their hormonal health.

The second point concerns two studies on the health status of working women in the post-menopausal period after sexual maturity. Japan's number of working women is increasing annually, which aligns with its aim of creating a society where women are active. Health support for working women during menopause is indispensable for them to be active in the long term. In the future, there is an urgent need to conduct research on the health of women after sexual maturity and consider support for them.

Third, there is a paucity of research on working men. In our country, a high percentage of male managers⁵) and working women are supervised by men. However, male managers' knowledge of menstruation, its related symptoms, and women-specific diseases are all lower than that of female managers³⁵). On the other hand, 60% of men in their 20s perceive that they would like to understand more about menstruation.²⁵) In considering the menstrual health of working women, it is necessary to improve not only the health literacy of women but also the health literacy of their surroundings and managers³⁶), and understanding the work environment and the men they work with is essential. As this analysis included only one study conducted on men, it is necessary to further investigate their awareness and knowledge of hormone-related health among working women and the need to promote a healthy workplace culture.

Fourth, the health of working women should be considered from the perspective of each phase of the menstrual cycle (follicular, luteal, and menstrual), which was done by only one study in this analysis. Female hormones fluctuate over a short period of time, and subjective symptoms change during the different cycle phases. In a report examining the relationship between the menstrual cycle and nurses' late-night work, night shift work during the luteal phase was found

to be significantly more burdensome for nurses³⁷⁾. Therefore, a detailed study on the effects of female hormonal cycles on working women is required.

4.3. Study Limitations

To examine the menstrual health of working women in Japan, the keywords for this study were “working women” AND “health” AND “menstruation” AND “menopause. As such, it is undeniable that literature on specific occupations, such as nursing or architecture, may not have been included in the study. In addition, the number of references was small, and it is difficult to say whether the study revealed the entire picture of menstrual health among working women, who are diverse in nature. Further studies are needed to confirm this hypothesis.

5. Conclusion

This study aimed to clarify the status of studies on menstruation among working women in Japan over the past ten years and examine research issues for the future. A review of 21 studies showed that factors associated with the appearance of menstrual symptoms included age, night-shift work, and stress. The effects of menstruation on work include inaccuracy at work, feelings of inefficiency, enduring symptoms, low use of social systems such as menstrual leave, and a lack of awareness among male managers. In addition, few women practiced self-care for their menstrual symptoms. Factors such as the amount of menstrual blood loss, the degree of menstrual symptoms, the presence or absence of obstacles to work, and awareness of self-care were found to be related to self-care implementation. It was suggested that working women need to be supported to adopt self-care as a routine before menstruation begins and that education related to menstruation is needed for both men and women. This study also suggests the need to accumulate more research regarding female hormones throughout the lives of working women.

Conflicts of interest

This research was presented at the 22nd Annual Conference of the Japanese Society for Women’s Health. It was also part of the “Basic Research for the Development of Health Support Programs for the Well-Being of Working Women,” a research theme of the Dokkyo International Medical Education and Research Foundation Award for Research Encouragement, and was subsidized by the Dokkyo International Medical Education and Research Foundation.

There are no conflicts of interest related to this study.

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