Menstrual Cycle and Workplace Issues: Review of the Literature

O ciclo menstrual e o local de trabalho: Revisão de literatura

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Abstract

Physical and emotional symptoms relating to the menstrual cycle can have different effects for different women. For women who experience extreme symptoms, such as pain, heavy bleeding and mood disruptions, symptoms may have an impact on functioning at work. Health practitioners may need to make special considerations when working with women who experience menstrual disorder symptoms. This article explores relevant articles related to menstrual disorders and the workplace. Various topics are covered with a special focus on occupational health considerations. Menstrual cycle studies have mostly focused on quantitative research and have largely neglected the importance of women's subjective experiences. This article identifies that most studies have overlooked such issues up to date, and provides an overview of reasons why more mixed methods research should be conducted on menstrual cycle

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studies. Women's subjective experiences are often overlooked. Women who experience imposing menstrual cycle symptoms would benefit from person-centred treatment interventions.

Keywords: menstrual cycle, workplace, occupational health, gender.

Resumo

Os sintomas físicos e emocionais associados ao ciclo menstrual exercem diferentes efeitos sobre cada mulher. Algumas mulheres apresentam sintomas extremos, como, por exemplo, dores, fluxo intenso e alterações de humor, e estes sintomas podem influenciar o seu desempenho no local de trabalho. Os profissionais de saúde poderão ter de tomar em consideração fatores especiais no caso de mulheres que apresentam sintomas de distúrbios menstruais. O presente artigo explora outros artigos relevantes relacionados com distúrbios menstruais e o local de trabalho. São abordados diferentes tópicos com um enfoque especial em considerações sobre saúde ocupacional. Os estudos sobre o ciclo menstrual têm-se focado predominantemente numa investigação quantitativa, negligenciando, em grande medida, a importância das experiências subjetivas de cada mulher. Este artigo evidencia que a maioria dos estudos até ao momento tem descurado esta questão, e fornece uma visão geral sobre as razões pelas quais devem existir métodos de investigação mais variados em estudos sobre o ciclo menstrual. As experiências subjetivas de cada mulher são frequentemente descuradas. As mulheres que apresentam sintomas menstruais difíceis poderiam beneficiar de intervenções de tratamento centradas na pessoa.

Palavras-chave: ciclo menstrual, local de trabalho, saúde ocupacional, sexo.

Menstrual cycle function may be affected by many factors such as hormones, age, smoking, body weight, exercise, race, life events, perceived stress, physiological conditions, and work environment. This area of research is relevant for occupational, social, clinical, rehabilitation,

health, feminist and counseling psychologists. Within this framework, relevant variables for menstrual cycle research include physical and emotional symptoms, psychosocial issues and gender. Physical and emotional symptoms of the menstrual cycle may affect the lives of some women, and most research on the menstrual cycle and the workplace has been medico-scientific with a focus on reproductive health or quantifying symptoms. Most research on the menstrual cycle has been based on student populations (Anson, 1999; Bachmann & Kemman, 1982; Chandra & Chatuverdi, 1989; Rasheed & Al-Sowielem, 2003; Singh, Kiran, Singh, Nel, Singh & Tiwari, 2008; Whitehead, Busch, Heller, & Costa, 1986), studies of the nursing profession (Chung, Yao, & Wan, 2005; Hatch, Figa-Talamanca, & Salerno, 1999; Labyak, Lava, Turek, & Zee, 2002; Lawson et al., 2011; Lin, Lin, & Shiao, 2007) or has focused on environmental occupational health issues (Christiani, Niu, & Xu, 1995; Hsieh, Wang, Cheng, & Chen, 2005; Messing, Saurel-Cubizolles, Bourgine, & Kaminski, 1993; Mergler & Vezina, 1985; Thurston et al, 2000; Yao et al., 2009). Few studies have relied on non-clinical or non-occupation specific studies, and qualitative studies focusing on women's experiences of their menstrual cycle are minimal, few have used mixed methods, and only a few qualitative studies exist which have identified important psychosocial issues.

Menstrual cycle function and patterns are often studied because of the impact on fertility. It is hoped that this article will highlight areas where previous research has been lacking and where recent research will provide new insights. This article provides an overview of these issues for consideration, with a specific focus on menstrual cycle, workplace and stress research where mixed methods studies are minimal and lacking in women's subjective experiences through qualitative data.

Importance of Menstrual Cycle Studies

It has been considered that the age of the onset of menstruation is an important predictor of women's health across the lifespan. Worldwide, young women are starting their menstrual cycles at younger ages (Steingraber, 2007, p.26), and there are reasons for concern in terms of physical,

emotional, psychological and sociological issues. Legato (2002) advises that there are six diseases that can intensify in relation to menstrual disorders for some women: asthma, arthritis, migraine headaches, diabetes, depression, and epilepsy. She highlights several health issues that may be impacted by the menstrual cycle:

- Women with epilepsy often have seizures just before or on the first day of their menstrual period (p. 12)
- Women with asthma often have attacks at the beginning of their cycles (p. 12)
- Many women report that the symptoms of their autoimmune symptoms worsen during specific times of their menstrual cycle (p. 124).
- Women diagnosed with arrhythmia are more prone to bursts of rapid heart rate before their menstrual cycle (p. 111).
- Hormone shifts can have a significant impact on the way women process medications, which can be especially dangerous for women who have epilepsy (p. 66).

From a rehabilitation perspective, these are significant concerns for health professionals working with women with differing health conditions. Women who suffer with severe and disruptive physical or emotional menstrual cycle symptoms on an on-going basis often suffer in silence. In a study of women with endometriosis, Markovic, Manderson, and Warren (2008, p. 350) highlighted the following:

> Feminist arguments that pain, discomfort and varying levels of flow are natural (Boston Women's Health Collective, 1984) and the rejection of medicalization of women's normal bodily experiences (Meyer, 2001) have also made it difficult for women to question the dimension of pain and to consider medical advice (Hurskainen et al., 2001). Given this, women who experience severe menstrual pain are caught in a dilemma. Their task is to distinguish their experience of menstruation from those of other women (Fournier, 2002), to acknowledge the possibility of a

> medical rather than a social basis to this anomaly (Bransen, 1992), and to convince a doctor – or a number of doctors – that their subjective experience or sensibility is 'real' and requiring further attention (Cox et al., 2003b).

The following section will provide an overview of relevant menstrual cycle studies that relate to stress and symptoms. Would monitoring the menstrual cycle and assisting women with identifying symptoms be helpful to increase communication with health professionals? What is the importance of considering external variables where symptoms are intense and intrusive?

Heavy Bleeding and Pain

Heavy bleeding and pain are the most common reasons that women seek help for problem symptoms. A study on menstrual symptoms conducted by Santer, Wyke, and Warner (2007) combined quantitative and qualitative data. Participants consisted of 2,833 women who were recruited from 19 general practice offices in Scotland. Their community survey asked: "How heavy are your periods?" The symptoms were scaled by light loss, moderate loss, heavy loss, or very heavy loss (over the previous six months). Out of this sample, 906 women reported "heavy" or "very heavy" symptoms. These women were sent a free text question: "What bothers you most about your periods?" Responses were coded, and coding schemes were developed after a review of 100 questionnaires. Over a quarter (27.4%) reported pain, 19.6% reported heaviness, 17.4% mood changes/tiredness, 10.8% reported irregularity or other issues of timing, 5.7% reported general inconvenience, 2.8% reported breast pain/swelling, 1.3% reported accidents, 4.5% other (pains in legs, sickness, diarrhea, headaches), and 10.4% left answers blank. The researchers found that even amongst women who had reported heavy or very heavy menstrual bleeding, pain remained the first concern for these women. Interviews were conducted with 32 women (aged 27-45) who reported their periods as heavy or very heavy on the questionnaire. Almost half of the participants

(14) reported marked or severe pain. Interviewees who reported heavy periods were asked whether they felt their periods were a problem for them and responses indicated the degree of impact that the menstrual cycle had on quality of life. The researchers found that:

> Women reporting heavy menstrual bleeding wrote that they were as bothered by menstrual pain as they were by heavy loss. Qualitative interviews with women reporting heavy periods suggested that some found it difficult to distinguish which of their menstrual symptoms was the main cause of the impact of their periods on everyday life. Perceptions of periods as a problem was related to the impact of a range of symptoms on everyday life which, in turn, was linked to individuals' social circumstances such as type of employment or degree of flexibility around domestic responsibilities (Discussion section, para.1).

This demonstrates the importance of qualitative interviews, which clarified that women with heavy bleeding may also experience pain symptoms, and the impact that such symptoms may have on activities of daily living and in work. Strengths of the study were the size of the sample and access to participants from different levels of the community. One limitation of study was that it focused primarily on more chronic symptoms of heavy bleeding; however, the qualitative focus of the study provided insight into participant's own experiences.

Menstrual Cycle and Stress

Higher job stress has an impact on menstrual cycle patterns, specifically linked to fewer ovulatory phases. One of the most quoted studies in the literature is a study conducted by Hatch, et al. (1999). Their study looked at work stress and menstrual patterns among American (n=99) and Italian (n=25) nurses. Daily diaries were used to monitor menstrual function, which measured basal body temperature and menstrual bleeding status. (Basal body temperature measurements can identify evidence of ovulation, which helps to identify menstrual phase). Nineteen core

questions were used which included one question about the perceived level of work stress. Job stress was evaluated by objective environmental and work characteristics (patient care demands, system issues including overtime, shift changes, staff changes, policy changes, staff rotation and staff relationships) and subjective perceived stress (one question measured on a five point Likert scale). They found that nurses in high stress units had an increased risk for long and monophasic (anovulatory) cycles meaning less ovulation which can impact fertility. Women who perceived their stress at work to be high or who reported strenuous work activity had higher risks of longer cycles. This study was limited in that it only focused on nurses, and did not use a standardized tool for measuring stress, and only studied stress and menstrual cycle function. No qualitative interviews were conducted to explore other issues of the menstrual cycle (such as pain) or further details on the personal lives of the nurses. However, it is noteworthy as it was one of the first studies to conclude that menstrual function may be affected by stressful work conditions.

Another study on psychological stress in the workplace and menstrual function was conducted by Fenster, et al. (1999). Participants consisted of 276 healthy premenopausal women (18-39) who collected daily urine samples, and monitored menstrual cycle symptoms with daily diaries for five menstrual cycles. Menstrual cycle function was measured by length of bleeding time, cycle length, and follicular phase length. A standardized measure was used for this study. Telephone interviews were conducted using an abbreviated form of Karasek's et al. (1998) Job Content Questionnaire to evaluate psychological job stress and social support at work (based on concepts that job stress results from high psychological demands in combination with low control over those demands, social support at work can ameliorate the effects of stressful work). The researchers found that stressful work (high demand in combination with low control) was not strongly related to an increased risk for anovulation or cycle variability but they did find that women who worked in stressful jobs had a more than double risk for short cycle length compared with women not working in stressful jobs (adjusted odds ratio = 2.24, 95% confidence interval 1.09-4.59). Two strengths of this study were that it used information from

a non-occupation specific population (women had been participants in the California Women's Reproductive Health Study, 1990-1991), and they used a validated tool to measure stress. Although medical in nature (using urine samples), and only focused on menstrual cycle function, it did identify that women in more stressful jobs had experienced issues with their menstrual cycles.

Perceived high job stress is associated with irregular menstrual cycles, and single and unmarried women may experience more abnormal cycles. A study on the impact of perceived job stress on menstrual patterns among Taiwanese nurses (Lin, Lin, & Shiao, 2007) found that self-perceived high job stress was significantly associated with irregular menstrual cycle length and regularity. Nurses (*N*=746, aged 20-45) from five psychiatric facilities and four general hospitals were given structured self-administered questionnaires and the Job Content Questionnaire (JCQ). They found that the level of self-perceived job stress was associated with a risk of irregularity in menstrual cycles and a risk of prolonged menstrual bleeding periods. Single and unmarried participants were more likely to have abnormal menstrual cycles (compared to married women, suggesting that married women may have more support at home to relieve stress). The researchers stated that one limitation to their study was that the study was cross-sectional, relying on women's recall and it was difficult to ascertain definitive causal relationships, stating that "menstrual problems might have caused low job performances, which consequently lead to a high level of self-perceived job stress" (p. 713). In addition, this study only focused on nurses, and only focused on menstrual cycle patterns and stress, the study did not consider other issues such as pain and emotional symptoms. However it did measure stress using a standardized measure and considered stress and the impact on menstrual cycle patterns. From an intersectionality framework, the findings regarding single and unmarried women experiencing more abnormal symptoms offers an interesting social angle.

Life stress may be associated with pain and heavy bleeding. A study of 170 healthy premenopausal civilian and military employees of the United States Air Force examined the relationship between work-related

or life event stress and menstrual disorders. Gordley, Lemasters, Simpson and Yinn (2000) administered a comprehensive questionnaire toevaluate the associations between race and job factors such as job stress, handling chemical mixtures and being a military or civilian employee of the U.S. Air Force. Multiple logistic regression analysis of questionnaires indicated no statistically significant association between work-related stress and menstrual disorders, but life event stress was significantly associated with dysmenorrhea (painful periods) and hypermenorrhea (higher rates of bleeding). The prevalence of menstrual disorders in their sample was 31.2% for dysmenorrhea, 17.9% for hypermenorrhea, and 12.0% for abnormal cycle length. The results of this study indicated that while work stress was not an important factor in determining menstrual disorders, life stress was. Although the study used standardized measures to quantify symptoms, no qualitative interviews were conducted which may have provided more insight into what was causing stress in the women's lives.

In a study of women serving aboard U.S. Navy ships, Kritz-Silverstein, Wingard and Garland (1999) reported that smokers were at an increased risk of cramps or pain requiring medication or time off work. Self-administered surveys collected information on weight, height, smoking, alcohol consumption and exercise. Women were asked to indicate (over the previous 90 days), if they had experienced cramps or pain during their period requiring medication or time off work, bleeding between periods, excessive frequency of periods, heavy periods, periods lasting for longer than a week, scanty menstrual flow, and irregular periods. Participants consisted of 2, 912 women aged 18-49. Younger women were more likely to report menstrual cycle symptoms and disorders. Compared to non-drinkers, women who consumed more alcoholic drinks had a higher prevalence rate of heavy periods. Compared to women who exercised less than twice per week, those with higher frequency of exercise were more likely to have excessive frequency of periods. Interestingly, officers were less likely to report several categories of menstrual symptoms. This study only focused on an occupation-based sample, and although it explored lifestyle factors, there was no explanation of possible underlying stress conditions that had an impact on the lifestyle factors.

A population-based prospective study conducted by Wang et al. (2004) found a significant association between stress and dysmenorrhea. The researchers stated: "Dysmenorrhea is the most common gynaecological disorder in women of reproductive age. Despite the association between stress and pregnancy outcomes, few studies have examined the possible link between stress and dysmenorrhea" (p. 1021). Participants consisted of 388 full-time female Chinese textile workers who were newly married (aged 20-34), and who had obtained permission to have a child under China's Family Planning policy.

Menstrual pain was defined as abdominal or low back pain during menstrual bleeding, and dysmenorrhea was defined as two or more days of menstrual pain within a menstrual cycle. Dysmenorrhea for each prospectively observed menstrual cycle was based on daily diary records where women recorded the occurrence of menstrual pain (yes or no). Past history of dysmenorrhea was assessed by a baseline questionnaire which asked "Did you experience dysmenorrhea during your menses during the past 12 months?" Stress was assessed by the use of a daily diary during the menstrual cycle "How would you describe your level of stress?" (This was marked as "not stressful," "a little stressful," or "very stressful"). Daily stress was coded as low, medium and high. Cycle-specific stress was defined during three phases: during the entire menstrual cycle, during the follicular phase, and during the luteal phase. Within each phase, high stress was defined as one or more day of reported high stress. Medium stress was defined as one or more day of reported medium stress but no reported high stress. Low stress was defined as no reported high or medium stress. Cycle-specific stress variables were used to predict the occurrence of dysmenorrhea in the subsequent menstrual cycles (p. 1023). The researchers found that the overall incidence of dysmenorrhea was 28% over 1,160 prospectively reported cycles where rates of dysmenorrhea increased with increasing levels of perceived stress. Dysmenorrhea was reported by 21.9% of the women with low stress, 28.7% for those with medium stress and 43.9% for women with high stress. Wang et al. (2004) observed that:

> Perceived stress in the follicular phase of the menstrual cycle appeared to have a greater influence on subsequent dysmenorrhea than did stress in the luteal phase; stress during both phases was associated with the highest risk of dysmenorrhea in the following cycle. A history of dysmenorrhea either in the preceding cycle or as reported at baseline, appeared to strengthen the association between stress and dysmenorrhea in the subsequent cycle (p. 1024).

The weakness in this study was that it relied on self-reports of perceived stress rather than the use of a standardized instrument. The study also relied on women's own self-descriptions of pain symptoms, and only focused on an occupation-specific population.

However, this study is relevant as it was a workplace based study, and indicated an association between stress and menstrual pain.

In another study of nurses in Taiwan (*N*= 151), Chung, Yao, and Wan (2005) used questionnaires and life/work diaries to consider the association between menstrual cycle function, dysmenorrhea, lifestyle and working conditions. Participants consisted of nurses (aged 21-44) working in wards, emergency rooms, intensive care units, outpatient departments and operating theaters (pregnant women and those planning to become pregnant were excluded from the study). Questionnaires collected demographic data, lifestyle data (smoking, passive tobacco exposure, drinking behavior, coffee consumption, self-perceived life satisfaction, self-perceived life stress, and major stressors), menstrual history, experience of dysmenorrhea, and Basal Body Temperature measurement over a year. Participants were given a life diary to monitor daily life events (sleep hours, exercise frequency, number of cold drinks), menstrual bleeding times, perceived bleeding amounts, and dysmenorrhea symptoms. The work diary included the number of patients the nurse cared for, working hours, shift work, self-perceived work satisfaction, self-perceived work stress, and major stressors. More than 90% expressed satisfaction in their current lives, and 16% felt strong life stress, particularly those who worked in the Intensive Care Unit. Main sources of stress were reported from home life such as

housekeeping work, taking care of family and maintaining family relationship (p. 150). The researchers found that lifestyle factors such as passive tobacco smoke exposure, perceived life satisfaction, perceived stress, and working factors (such as years worked, perceived work satisfaction and perceived work stress) were not significantly related to menstrual cycle regularity (length, duration, and amount of bleeding). However, they found that around "70% of the nurses complained of occasional or frequent dysmenorrhea" (p.155). Most who complained of dysmenorrhea were single-young single nurses or those with lower body weight/Body Mass Index. Sixty percent of the nurses with regular menstrual cycles and fixed night shifts had a menstrual cycle of less than 25 days (noting that this could be attributable to the regulation of endocrine at night time). Dysmenorrhea was related to age ($p<.01$), marital status ($p<.01$), and perceived life satisfaction ($p<.05$). This study was only focused on an occupation-based sample (nurses) and a weakness in the study is that it relied on self-report data (life diaries), and a questionnaire rather than the use of standardized tools. In addition, this study is relevant as it indicated that sources of stress that had an impact on symptoms were more likely to be caused by stress in the home.

Effort Reward Imbalance and Menstrual Disorders

In a study to explore the separate and combined effects of work and family stress on menstrual disorders and fibrocystic changes, Zhou, et al. (2010), found that the risk of menstrual disorders was significantly increased in relation to work and family stress. Menstrual disorders were associated with stress from work and family life, but not fibrocystic changes in working women. Participants consisted of 1,642 full time female railway workers in China (aged 20-55) who had a menstrual cycle in the previous six weeks. Women who were excluded were those who had used contraceptives in the past 12 months, had a history of pregnancy or abortion in the past 12 months, or had any diagnosed reproductive disease other than menstrual disorders or fibrocystic changes.

This study used two standardized measures. Work stress was measured by the Effort- Reward Imbalance Questionnaire (ERI). This measure consists of 23 items, with three sub-scales: effort (six items), reward (11 items, covering salary, promotion prospects, esteem and job security) and over-commitment (six items, measuring a personal pattern of coping with work demands). Items are scaled on a four point Likert scale: from "strongly disagree" to "strongly agree". The Family Stress Scale measured relationship and conflict with family members, care giving, household workload, and economic burden (using a Likert scale, from "strongly disagree" to "strongly agree"). Menstrual and breast conditions were evaluated by a gynecologic interview and medical examination. The diagnosis of menstrual disorders was based on individual interviews conducted by a female gynecologist. Three categories of menstrual disorders were identified (a) abnormal cycle length (interval between cycles less than 24 or greater than 35 days), (b) hypermenorrhea (either excessive bleeding of more than seven days or the amount of menstrual bleeding reported as heavy) and (d) dysmenorrhea (presence of menstrual pain severe enough to have an impact on women's daily activities). Fibrocystic issues of breast tissue were measured by near-infrared transillumination breast spectroscopy (TIBS). Rates of menstrual disorders in their sample were 59.3%, and fibrocystic changes at 54.8%. Women who had menstrual disorders reported significantly higher effort, over-commitment, effort-reward imbalance, family stress, and significantly lower reward than those who did not. No significant relationships were found regarding fibrocystic changes. The researchers stated:

> We found consistent associations between menstrual disorders and both work and family stress even after adjustment for demographic and gynecological confounding factors. Moreover, a combined exposure to high work stress and high family stress was observed to be associated with menstrual disorders, though no association between stress and fibrocystic changes was found. Similar results were observed by examining the associations

> between stress and three types of menstrual disorders (abnormal cycle length, hypermenorrhea and dysmenorrhea) (p. 364).

The strength of this study was in the use of a standardized, theory-based test (ERI), and the use of a second standardized test (Family Stress Scale), as well as the large sample population. Also, the use of a gynecologist to assist in the definitions of menstrual disorders assisted in clinical diagnoses. Limitations in this study were the focus on occupation-based participants, and not considering education, lifestyle factors and physical health issues. The authors stated:

> Our results call for tailored intervention measures to reduce the burden of stressful psychosocial work and family environment on working women. Practical measures should focus on, raising an awareness of stress recognition among working women, improving career prospects (continuous training, appropriate remuneration, and harmonious interpersonal relations); and offering services by the organization (work-family balance arrangements, flexible work schedule, and coping education). Such measurements are an important prerequisite for women's reproductive well-being (p. 365).

A unique study using a large scale sample from the general population was conducted by László and Kopp (2009) who also cited that: "Despite the high prevalence of dysmenorrhea and the plausibility of the relationship, little attention has been paid to the association between work-related stress and menstrual pain" (p. 157). They also noted that most studies have focused on specific occupations such as nurses, cotton mill workers, textile workers and airforce workers. Their study found that work stress was associated with dysmenorrhea. Participants consisted of 821 pre-menopausal working women (who were not pregnant). Work stress was measured by an abbreviated version of the Effort-Reward Imbalance Questionnaire (ERI). This measure consists of fifteen items which is divided into three scales, effort (three items: time pressure, frequent interruptions and disturbances, and increasing demands on the job), and reward (six items: job promotion

prospects, undesirable changes in the work situation, job security, respect and monetary gratification). The effort scale consists of two answers. Respondents answer whether they are exposed to different stress factors, and if yes, indicate the extent of distress. The over-commitment scale consists of six items assessing the inability to withdraw from work obligations. Items are scaled on a four point Likert scale: "strongly disagree" to "strongly agree." The Family Stress Scale measured relationship and conflict with family members, care giving, household workload, and economic burden (using a Likert scale, from "strongly disagree" to "strongly agree"). Demographic data consisted of occupational class, personal and mother's education, marital status, attempts at conception, number of children, smoking, weight, height, and Body Mass Index. Engagement in physical activity was also documented.

Depression symptoms were assessed using an abbreviated version of the Beck Depression Inventory (Beck, Ward, Mendelson, Mock, & Erbaugh, 1961). Negative affect was measured by a five item version of the negative affect subscale developed by Johan Denollet (1998). To assess menstrual pain, the following question was asked: "Does menstrual pain limit your daily activity?" (Yes or No). The researchers found that after controlling for age, occupational class, mother's education, marital status, number of children, unsuccessful conception of one year, previous miscarriage, smoking, body mass index, physical activity and depressive symptoms, that effort-reward imbalance and over-commitment were associated with an increased risk of menstrual pain. The researchers suggested that the relationship between work-related psychosocial factors and painful menstruation should be further investigated to determine factors that may explain this situation. They noted that "it is plausible that mental health does not act only as a confounder in the relationship between work stress and dysmenorrhoea, but also as a potential mediator of this association" (p. 161). They also suggested that "behavioural risk factors may also mediate between work stress and primary dysmenorrhea" (p. 161) and found that "the association between work stress and dysmenorrhea was not influenced by health behaviours" (p. 161). This study concluded that:

> The relationship between work-related psychosocial factors and painful menstruation needs to be further investigated to determine factors that may explain this relationship. If a causal relationship between work stress and dysmenorrhea is supported by future studies, workplace stress programs aiming to reduce stress at work might attenuate the negative effects of this menstrual disorder and will reduce the costs burdening society (p. 162).

One of the limitations of this study was that the assessment of menstrual pain was limited to one question- "Does menstrual pain limit your daily activity?" (Yes or No). However, this study was unique as it also combined psychosocial theory and offered several new considerations for conducting future studies.

In general, the bulk of the studies that have explored disordered menstrual cycle symptoms and stress have not included qualitative data. Table 1 provides an overview of menstrual cycle and stress studies reviewed in this article and indicates that the focus has often been on quantifying symptoms where there has rarely been an examination of further psychosocial variables. Women's personal voices have been lost in these studies as symptoms have been quantified yet not explored further to provide a better insight into psychological and social issues that may also be occurring in the workplace and at home which may further exacerbate symptoms. The mixed methods study conducted by Santer, Wyke and Warner (2007) provided details on how symptoms had an impact on women personally, which identified specific social circumstances and issues around the difficulty in identifying and quantifying symptoms. Where symptoms may overlap, they may also be difficult to quantify fully. Further, life stress and family stress are broad areas. Supporting qualitative data with quantitative data through an exploratory mixed methods study can offer further themes and categories to explore and support with quantitative data. The social context is often overlooked.

Table 1.
Overview of Menstrual Cycle and Stress Studies

Authors	Type of Study	Conclusions	*N*
Hatch, Figa-Talamanca & Salerno (1999)	Quantitative	Menstrual function may be affected by stressful work conditions.	2,833
Fenster, et al (1999)	Quantitative	Women with stressful jobs have more than double risk for short cycle length.	124
Gordley, Lemasters, Simpson & Yin (2000)	Quantitative	Life stress associated with dysmenorrhea and higher rates of bleeding.	170
Wang, et al. (2004)	Quantitative	Significant association between workplace stress and dysmenorrhea.	388
Chung, Yao & Wan (2005)	Quantitative with life diaries	Age, marital status, and perceived life satisfaction significantly related to dysmenorrhea.	151
Lin, Lin & Shiao (2007)	Quantitative	Self-perceived job stress significantly associated with irregular cycle length and regularity Women with heavy bleeding issues.	746
Santer, Wyke & Warner (2007)	Mixed Methods	Difficult to distinguish which symptoms cause the most impact. Problem periods relate to impact of symptoms which can be linked to social circumstances.	2,833, *n*=32
László & Kopp (2009)	Quantitative	Work stress associated with dysmenorrhea.	821
Zhou, et al. (2010)	Quantitative	Menstrual disorders associated with stress from work and family life.	1,642

The Social Context

Higher rates of external stress and lower rates of support systems can have an impact on well-being. The context of social support may include friends, family, co-workers, and other employees within a workplace. With lower levels of social and emotional support, less life satisfaction, and frequent mental distress, women are less likely to see a doctor for routine check-ups (Willet, Hayes, Zaha, & Fuddy, 2012). Lower levels of

social support have been associated with smoking, physical inactivity, being over-weight, and poor self-perceptions of health status for both men and women (Croezen et al., 2012). In the workplace, social support has been negatively associated with burnout and positively associated with job satisfaction and productivity (Baruch-Feldman, Brondolo, Ben-Dayan, & Schwarz, 2002). Further, it has been observed that a lack of supervisor's support in the workplace has been associated with women's longer absenteeism (Väänänen, et al., 2003). The social context of a working environment therefore may have an impact on stress and well-being, particularly where there are conflicts with superiors. Within this context, for women with difficult menstrual cycle symptoms, the loss of social support may lead to more emotional distress and menstrual pain (Alonso & Coe, 2001). Social support is a variable that is measured in the forthcoming new study findings and important to take into consideration for workplace stress and the impact on the menstrual cycle.

Expectations for behaviors are influenced by stereotypes. According to Patton and Johns (2007), beliefs and stereotypes concerning women as a social category may be more important than actual health problems or family situations in relation to actual absence by women (p.1586). For women in the workplace, gender stereotyping has a particular impact. Steinberg, True and Russo (2008) noted the following:

> Gender stereotyping has long been linked to distinct employment issues for women, who must deal with evaluation bias, greater pressure on their performance, exclusion from certain jobs and promotional opportunities, differential supervision, overprotection, unprofessional sexual remarks, incivility and harassment, unequal employment rewards, and gender segregation between and within occupations (p. 657).

Stigmatization

A common theme in the literature is the medicalization of women's menstrual cycle symptoms (Chrisler & Caplan, 2002; Scambler & Scambler,

1993; Scambler & Scambler, 1985; Ussher, 2010). Although there is much literature on the subject, the *Merriam-Webster Online Dictionary* defines "medicalize" as: "to view or treat as a medical concern, problem, or disorder." In this regard, and considering the menstrual cycle, making it a medical issue denies the social issues related to the topic; connected to this, there is also social stigma. Studies on menstrual cycle research have been criticized as further medicalizing women's health issues, and critics point out that menstrual cycle studies can widen the gap between gender differences. Many studies identify risks and hazards that have an impact on reproductive health, and indeed reproductive health has been the focus of most menstrual cycle studies in relation to the workplace. Within all of the studies, there is a lack of women's subjective experiences which highlight psychosocial issues and their own personal experiences of how symptoms can have an impact on quality of life. In addition, women may experience social stigma for several different reasons, Russo and Tartaro (2009) highlight the following:

> Stigmatization associated with stressful life events can affect women's willingness to seek help for dealing with those events, undermine their mental health, and increase risk for depression. Depending on the norms of the community, women can be stigmatized for being victims of childhood sexual abuse, being raped, losing their virginity, staying single, having more than one sexual partner, having menstrual cramps, being a lesbian, having a child when not married, being childless, being battered by their husband, being too fat, having an abortion, placing a child for adoption, working when her children are young, being a "bad" mother, and being menopausal among other things (p. 471).

Modeling Influences

Workplace environments offer modeling influences which have an impact on behaviors. According to Bandura (1998): "Social learning influences shape the form of cultural evolution by favoring behavioral

variants that are efficacious in particular milieus" (p. 73). People learn by observation through modeling, and the consequences that the model receives affect the behavior of the observer- if punishment is involved, a behavior is less likely to take place. People are more likely to perform the behavior they observe if the model is similar to themselves. An error in evaluating the context of a situation can have negative consequences. This may involve being labelled as a person with a problem. For example, a woman with menstrual problems in a non-absence culture environment (or male-dominated work environment) may be perceived as unreliable due to missing work because of symptoms. To avoid stigmatization, she may choose to mask symptoms (and behaviors) modeled on others to avoid repercussions (a fear of reprisals such as being stigmatized or a potential loss of opportunities for career advancement). In other words, for a woman who has difficult menstrual cycle symptoms who perceives another woman (who has difficult symptoms) who misses work as a negative model, she may observe negative feedback that the stigmatized person has received. For example, Whitehead, Busch, Heller, and Costa (1986) observed that specific types of menstrual symptoms seem to be learned. In a sample of nursing students (N=351), they identified that acceptance of the modeling of the menstrual sick role were correlated more highly with symptom reports, clinic visits and absenteeism for menstrual symptoms compared to non-gynecological symptoms. Women who had been allowed to adopt a sick role for menstrual symptoms or whose mother modeled menstrual distress reported significantly more menstrual symptoms, clinic visits, and disability days as adults. This is but one example, but it indicates how social learning can also have an impact on adapted health behaviors, and offers additional considerations regarding personal behaviors within a workplace culture. Similarly, workplaces with more supportive women, where it is acceptable to discuss menstrual cycle symptoms openly, might be more supportive about difficult symptoms and absenteeism due to symptoms. Although this is a brief article, it is important to consider that most menstrual cycle studies have been medical in nature and have often disregarded social issues.

Summary

This review has covered topics relevant to the research on menstrual cycle in the workplace. Several factors have been described, including medical, socio-cultural, and workplace issues. More focus was placed on studies that have looked at the menstrual cycle and stress issues. In general, most menstrual cycle studies with a workplace focus have been based around reproductive issues and/or stress, with little consideration of broader psychosocial issues- mostly excluding in-depth qualitative elements. This article offers an overview of where research has previously been focused, highlighting areas where information has been lacking. This article contributes to current issues in psychology by highlighting that women who experience difficult menstrual cycle symptoms would benefit from personalized and specialized support interventions. Further, there is currently a lack of mixed methods in menstrual cycle studies which focus on women's subjective experiences. Qualitative data are important to develop appropriate treatment interventions as such data provide rich and detailed information about the social context. Supporting qualitative data with quantitative material is important as it provides additional information to validate the existence of symptoms. Pure quantitative statistics and medical model studies do not fully provide the depth of insight that can be provided by women themselves.

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