

PREMENSTRUAL SYNDROME AND WORK AMONG FEMALE ACADEMIC TEACHING STAFF IN A GOVERNMENTAL FACULTY OF MEDICINE IN EGYPT

By

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Abstract

Introduction: Premenstrual syndrome (PMS) affects many women during their work life. PMS in working Egyptian women, however, are less well researched. **Aim of work:** To determine the prevalence of PMS in a sample of academic female teaching staff in Zagazig University and explore PMS in the work context. **Materials and methods:** One hundred and eighty six academic female from Zagazig University (mean age=30.74 years) participated in a comparative cross-sectional study involving a semi-structured interview and completing prospective premenstrual symptom questionnaire between April and December 2015. **Results:** The results showed a high prevalence rate (66%, n=122) had PMS. Student's t-tests, chi-square tests were used to examine group differences and multiple regression analyses to explore relationships between background variables and PMS symptom types (behavioral, physical, and psychological) and work outcomes of interest (job performance, work capacity, coping with work, and whether work made symptoms worse). Compared to staff without PMS, women with PMS experienced greater impaired work capacity, job performance, and perceived work to exacerbate their PMS symptoms. **Conclusion:** This study showed that PMS is highly prevalent among female academic teaching staff in Zagazig University and is more likely to show greater perceptions of impaired work capacity, performance, as well as perceiving work to make symptoms worse.

Keywords: Premenstrual syndrome (PMS), Prevalence, Zagazig University, Working female and Academic female staff members.

Introduction

Millions of women during their reproductive years are affected by premenstrual syndrome (PMS). PMS is characterized by the cyclic recurrence of symptoms. Specifically, mood/psychological, behavioral, and/or physical symptoms occurring during the luteal phase and remitting by the end of menses with at least one week symptom-free during the cycle. The crucial characteristic of PMS is the timing of the symptoms and their severity, which must be enough to impact on normal functioning (Freeman et al., 2011) and in turn negatively affect quality of life (QOL) by influencing behaviour and interfering with daily activities (Lustyk and Gerrish, 2010).

Over 200 different premenstrual changes or symptoms have been reported and up to 90% of women in their reproductive age experience at least one symptom (Campagne and Campagne, 2007). Previous research has estimates around 40% of Western women report moderate premenstrual distress that can be described as PMS. A recent meta-analyses (Direkvand-Moghadam et al., 2014) shows a pooled worldwide

prevalence of 47.5%. However, these rates varied according to continent. The lowest PMS prevalence is found in France (12%) whereas the highest in Iran (98%). The authors note that the reason for variations in prevalence rates could be due to methodological variations. These are commonly regarded as a main factor for variance in prevalence reporting as different types of samples (e.g. students, housewives, working women) and diagnostic tools (e.g. retrospective ratings of symptoms as opposed to prospective) can affect the accuracy of diagnosis (Direkvand-Moghadam et al., 2014).

Despite the above meta-analysis showing a recorded prevalence rate in Iran, PMS prevalence in the Middle East, particularly Arab regions, is not well recorded. Of the few studies have been conducted, higher prevalence rates are ubiquitous. For example, a study with university female students in Saudi Arabia found a high PMS prevalence of 78.5% (Al-Batanony and AL-Nohair, 2014). Another study conducted on a sample of Jordanian women shows a similarly high prevalence of 80.2% (Hamaideh et al., 2014), and within

Egyptian samples, studies shows a range of prevalence figures including 47.2% (Abd El-Hamid et al., 2013), and 64.8% (Seedhom et al., 2013). Methodological limitations of these studies include the above noted factors for variance i.e. the use of inappropriate samples (e.g. students) and/or symptom recording (i.e. retrospective measurement). Therefore, it is important to calculate prevalence rates in a sample of working Egyptian women using prospective symptom recoding methods. This is the first objective of the present study.

Another issue with understanding and measuring prevalence rates is the fact that the aetiology of PMS remains uncertain. It could be a complex interaction between multiple factors. A common perception is that altered regulation of neuro hormones and neurotransmitters is involved. However, there is no hormone or other laboratory test that confirms a diagnosis of PMS. Evidence from previous studies (Yonkers et al., 2008) suggests that women with and without PMS do not differ with respect to the production of gonadal steroids and PMS does not seem to be due to abnormal concentrations of sex

steroids, but the symptoms are triggered by fluctuations of such hormones. The difference between PMS and non-PMS women may therefore be due to those with PMS being more sensitive to such fluctuations and enhanced responsiveness to normal, fluctuating concentrations of these hormones (Yonkers et al., 2008). It is still not fully understood why differences across cultures occur but continued research with appropriate methodologies is important to help address this problem.

As described above, PMS is diagnosed when symptoms occur during the premenstrual phase of the menstrual cycle and severe enough to interfere with daily activities and negatively affect well-being. A measure of the severity of PMS is the extent to which the symptoms impair function. These impairments can occur across life domains, including interpersonal relationships, daily routine, and work productivity. If a symptom causes functional impairment, it should be considered worthy of treatment (Freeman et al., 2011; Lustyk and Gerrish, 2010). It is therefore important to understand how PMS and these life

domains are reflected and how they might influence one another.

Studies shows that moderate to severe premenstrual symptoms adversely affect working women during their reproductive years and lead to high rates of worker absenteeism, lower productivity and reduced quality of life (Sut, and Elcin, 2015; Hamaideh et al., 2014). Yet, premenstrual problems within the work context are still relatively under-researched, particularly in Arab populations. Given the potentially higher prevalence rates of PMS in Arab countries, and their associated costs, greater exploration and a better understanding of PMS in the Arabian work context is an important area of work. This is the second objective of the study.

The present study is conducted to achieve two main objectives. These include measure the prevalence of PMS among female staff using appropriate methodologies, and secondly, to examine PMS in the work context. Specifically, the effect of PMS status and symptoms on perceived work capacity, ability to cope with work, job performance, and whether work exacerbates symptoms.

Aim of work

This study aims to examine the prevalence of PMS in a sample of female teaching staff in Zagazig University using a prospective measuring approach and to examine the effects of PMS on work setting.

Materials and methods

-Study design:

Comparative cross sectional study involved a sample of academic teaching female staff in Zagazig University.

-Place and duration of the study:

The current study was conducted between April and December 2015 in academic departments, Faculty of Medicine, Zagazig University, Egypt.

-Study sample:

Three hundred and fifty-two female academic teaching staff within the Faculty of Medicine, Zagazig University, were invited to participate in the present study, excluding staff on temporary or extended periods of leave, these were representing all the female academic teaching staff below the age of 45 years old. Inclusion criteria were women aged 18-45 years,

has regular menstrual cycles of 21-35 days in length during the preceding 6 months, had no history of co-existing medical illness or psychiatric disorder (affective disorders, depression, anxiety, dysthymia, panic, personality disorders, anemia, anorexia, diabetes mellitus, dysmenorrhea, endometriosis, hypothyroidism). In addition, women who had a hysterectomy, on medications, including contraceptive pills and hormonal treatments, or a history of alcohol intake or drug abuse were ineligible. The total number of eligible female staff to participate in the current study was 264 (75% from the total invited females). From an initial expression of interest based, 214 consent to participate. In order to fix the elements of work environment for all the participants and as the interview is face to face interview not an email or telephone questionnaire, for these reasons the sample size was confined to this group and the researchers didn't invite more females from different work places to participate in this study .

-Study methods:

Participants then took part in a 30-minute face-to-face semi-structured

interview with researchers about their experience of premenstrual symptoms and work. The interview contained three parts and the interviewer recorded the participant's responses for subsequent analyses. Part one asked for background data including socio demographic data, occupational history and information, menstrual data and medical history (i.e. age, residence, marital status, body mass index, occupation, working years, working hours per day, onset of menarche, duration and regularity of menses). Part two asked about the effect of premenstrual symptoms on work and social life. Participants were asked to indicate ('yes' or 'no') whether a premenstrual symptoms interfere with housework, relationships with co-workers, family members, friends and acquaintances, part one and two were adapted from other similar studies (Miyaoka et al., 2011; Hamaideh et al., 2014; Hammam et al., 2012). Finally, participants are asked to respond ('yes' with score =1 or 'no' with score= 0) as to whether premenstrual symptoms "psychological, behavioural, physical" affect their work capacity, their ability to cope at work and whether they felt their employed work make their symptoms

worse and then total score ranging from (0 to 20, the total number of symptoms that could affect these variables) was calculated for each variable according to the positive answers they report.

Finally, part three asked two items from the World Health Organization's (WHO) Health and Work Questionnaire (short-form) regarding job performance (Kessler et al., 2003, 2004). Participants rate their performance on a 10-point Likert scale (0=worst performance, 10=top performance) over the past year or two, and during the past four weeks.

After completing the interview, participants were provided with diary materials to prospectively record their premenstrual symptom daily for two consecutive cycles. Women were asked to rate symptoms for each day as either "no symptoms" (1), "mild symptoms" (2), "moderate symptoms" (3), or "severe symptoms" (4) (Dickerson et al. 2003). One hundred and eighty-six participants completed and returned the diaries (attrition rate of 13%), which were used to perform the analyses.

Gynecology and psychiatry specialists carried out diagnoses of PMS. They used participant interview

responses and diaries. The prospective daily symptom ratings of the two menstrual cycles were assessed for symptoms patterns and severity and a diagnosis of PMS was given where appropriate. The recommendations of the American College of Obstetrics and Gynaecology (ACOG, 2000), the PMS diagnostic criteria developed by the University of California at San Diego, and the National Institute of Mental Health are followed to diagnose the participants (Dickerson et al., 2003).

Consent

Written informed consent was signed from all participants after explaining the aim of the study and confidentiality of the information was assured.

Ethical Approval

Ethical approval for the study is granted by the Institutional Review Board (IRB) of the Faculty of Medicine; Zagazig University

Data Management

Data were coded and statistically analysed using SPSS version 19 (IBM, 2010). Comparison between group

means was done using student's t-test and comparison between categorical data variables was done using chi-square test. Due to unequal group sizes, both parametric and non-parametric tests were performed and compared. The results were similar so parametric results were reported. Multiple regressions were also used

to explore relationships between background variables and premenstrual symptom types (behavioral, physical, and psychological) and work outcomes of interest (job performance, work capacity, coping with work, and whether work made symptoms worse). The significance level was considered at p-value less than 0.05.

Results

Table (1): Socio demographic and occupational data.

Demographic, occupational and menstrual variables	Mean \pm SD, and N (%)		
	PMS (n=122)	Non-PMS (n=64)	Combined (N=186)
Age	30.53 \pm 4.8	31.13 \pm 4.23	30.74 \pm 4.63
Range	23-44	26-42	23-44
Body mass index	27.76 \pm 3.94	27.71 \pm 4.01	27.75 \pm 3.95
Residence			
Rural	17 (13.9)	7 (10.9)	24 (12.9)
Urban	105 (86.1)	57 (89.1)	162 (87.1)
Marital status			
Married	90 (73.8)	43 (67.2)	133 (71.5)
Single/ divorced/ widowed	32 (26.2)	21 (32.8)	53 (28.5)
Occupation			
Demonstrator	25 (20.5)	15 (23.4)	40 (21.5)
Assistant lecturer	59 (48.4)	28 (43.8)	87 (46.8)
Lecturer	27 (22.1)	17 (26.6)	44 (23.7)
Assistant professor	11 (9.0)	4 (6.3)	15 (8.0)
Number of working years	6.02 \pm 3.5	5.83 \pm 3.34	5.96 \pm 3.46
Number of working hours /day	8.53 \pm 0.84	8.25 \pm 1.56	8.44 \pm 1.15
Income			
Satisfactory	97 (79.5)	53 (82.8)	150 (80.6)
Not satisfactory	25(20.5)	11 (17.2)	36 (19.4)
Age of menarche	12.36 \pm 0.87	12.31 \pm 1.02	12.34 \pm 0.92
Range	11-14	10-15	10-15
Duration of menses (days)	5.00 \pm 2.47	4.53 \pm 2.54	4.83 \pm 2.51
Length of menstrual cycle	27.76 \pm 3.94	27.71 \pm 4.01	27.75 \pm 3.95
Extent of menstrual flow			
Heavy	21 (17.2)	12 (18.8)	33 (17.7)
Moderate	94 (77.0)	48 (75.0)	142 (76.3)
Light	7 (5.7)	4 (6.3)	11 (6.0)
Family history of PMS:			
Yes	52 (42.6)	27 (42.2)	79 (42.5)
No	70 (57.4)	37 (57.8)	107 (57.5)

Table (1) : summarized the sample characteristics comprising 122 classified as having premenstrual symptoms (PMS) and 64 without substantial premenstrual symptoms (Non-PMS). This revealed a prevalence rate of 66%. There were no significant differences between the groups regarding socio demographic and occupational characteristics. Participants (PMS and non-PMS, respectively) were aged between 23-44 years; they have been in employment for around 6 years and work for 8-8.5 hours per day. The women lived mainly in urban areas, mostly married, and satisfied with their income (80.6%). The mean age of menarche was around 12 years of age and mean length of the menstrual cycle was typically around 28 days. The majority of the participants had moderate menstrual flow and 42.5% of women had a family history of PMS.

Table (2): Average scores and standard deviations of premenstrual symptoms affecting work capacity, impaired ability to cope with work, symptoms worsened by work, and work performance in the PMS and Non-PMS groups.

Variables	PMS N= 122 (Mean ± SD)	Non-PMS N= 64 (Mean ± SD)	Combined N= 186 (Mean ± SD)
Impaired work capacity	5.68±3.66***	3.50±2.87	4.93 ± 3.56
Symptoms worsened by work	8.07±3.21***	5.97±2.33	7.35 ± 3.10
Difficult coping at work	5.02±3.13	4.83±2.76	4.96 ± 3.01
Performance, past 4 weeks	7.4 ± 1.9**	5.9 ± 1.9	6.44 ± 2.08
Performance, past 2 years	6.7 ± 1.5**	4.6 ± 2.3	5.29 ± 2.32

** Significant $p < .001$,

*** Significant difference at $p < .0001$.

Table (2) : Showed that the mean scores were significantly ($p < .0001$) higher among the PMS group than the non-PMS group for impairment of work capacity and symptoms worsened by work. Moreover, for self-rated job performance, female staff with PMS reported statistically significant ($p < .001$) lower job performance scores over the past 4 weeks and the last 2 years than the non-PMS participants, statistically significant at ($p < .001$).

Table (3): Multiple regressions in background variables & premenstrual symptoms categories affecting work capacity, impaired ability to cope with work, symptoms worsened by work and Job performance (N=186).

Background variables	Impaired work capacity			Symptoms worsened by work			Difficulty coping at work			Job performance		
	SEB	β	t	SEB	β	t	SEB	β	t	SEB	β	t
Constant	6.05		.31	5.33		1.01	5.23		-.11	3.81		2.37
Age	.06	.13	1.70	.05	-.01	-.16	.05	.14	1.81	.04	.13	.22
Residence	.77	-.04	-.54	.68	-.01	-.17	.67	.08	1.02	.49	-.04	.61
Occupation	.61	.07	.46	.54	.01	.07	.53	.20	1.30	.38	.07	.91
Work years	.15	-.15	-.98	.14	-.02	-.10	.13	-.32	-2.08	.09	-.15	-1.44
Work hours	.22	.11	1.54	.20	-.05	-.62	.19	-.03	-.39	.14	.11	.23
Marital status	.62	-.04	-.53	.55	.02	.18	.54	.28	3.41***	.39	-.04	.79
Body mass Index	.07	-.12	-1.56	.06	-.09	-1.15	.06	-.12	-1.47	.04	-.12	-.25
Income	.71	.00	.00	.62	.10	1.28	.61	-.11	-1.38***	.45	.00	1.55*
Menarche age	.28	-.06	-.83	.24	-.03	-.39	.24	.03	.35	.17	-.06	.99
Duration of menses	.11	-.04	-.48	.09	.12	1.54	.09	.10	1.37	.07	-.04	.37
Length of menses	.14	.06	.76	.12	.06	.83	.12	.02	.23	.09	.057	-1.90
PMS symptom												
Physical	.03	.41	2.52	.03	.19	1.14***	.03	.09	.53	.13	.13	.13
Psychological	.03	.31	1.82***	.03					.10	.61	.03	.04
Behavioural	.03	.21	1.45	.03	.26	1.77	.03	.078	.52	.07	.07	.07

* $p < .05$

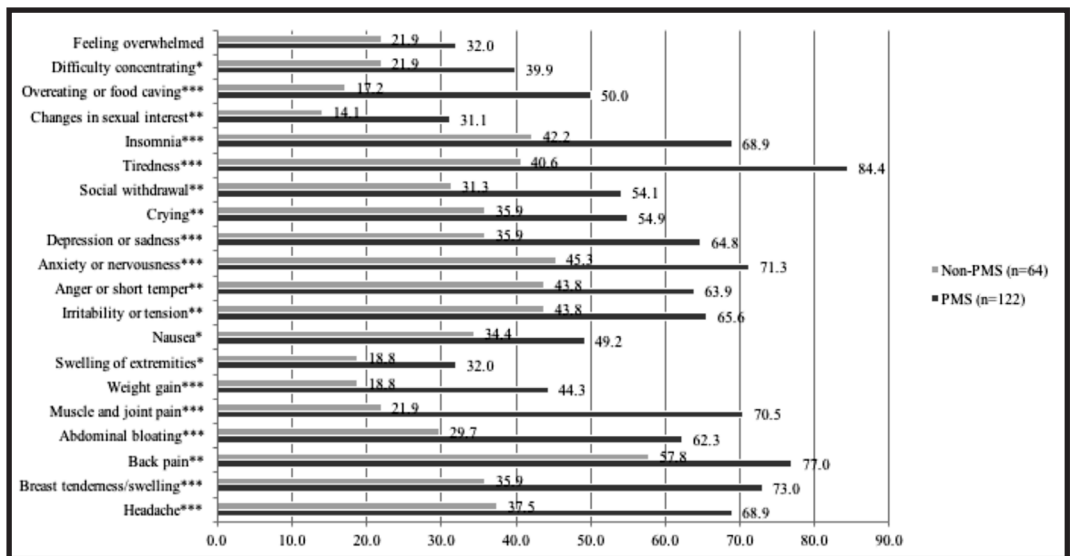
** $p < .01$;

*** $p < .001$.

Table (3) : Showed that multi regression model results of this table showed that the psychological symptoms was a significant predictor of impairment of work capacity, while premenstrual physical symptoms were significantly getting worse by work. On the other hand the significant predictors for the difficulty to cope with work were being married and having unsatisfactory income.

Also, the multiple regression models for predictors of job performance in the last 2 years reveal that the psychological symptoms was a significant predictor for low job performance ($p < .001$) and the satisfactory income was also a significant predictor of high job performance at ($p < .05$).

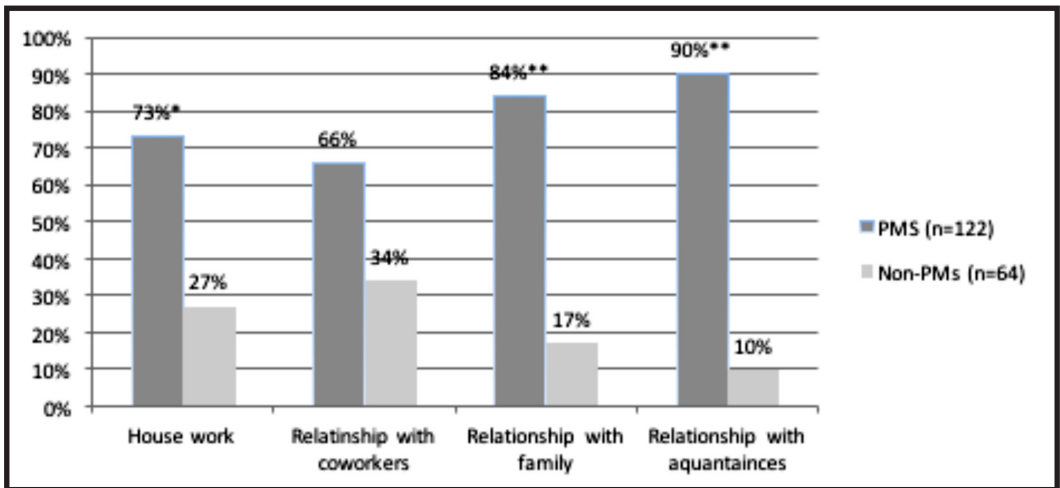
Figure 1. Premenstrual symptoms percentages among PMS and Non-PMS female medical teaching staff



Significant difference at * $p \leq .05$; ** $p \leq .01$; *** $p \leq .001$

All premenstrual symptoms were significantly more frequent among PMS than the non-PMS group (Figure 1). The most prevalent physical symptoms were back pain, breast tenderness and swelling, muscle and joint pain, and headaches. The most prevalent psychological symptom was anxiety or nervousness, and behavioral symptoms were tiredness, and insomnia.

Figure 2. : Impairment of social activities and relationships with others between PMS and non-PMS female medical teaching staff



*Significant at $p \leq .05$

**Significant at $p \leq .01$

Figure 2. : Showed significantly higher impairments were found among the PMS group compared to the non-PMS group in housework, and relationships with acquaintances ($p \leq .001$) and family ($p \leq .001$). Greater impairments were also shown in the PMS group for relationships with co-workers but this was not significant.

Discussion

Aligning with previous studies on Arab women (Hamaideh et al., 2014; Al-Batanony and AL-Nohair, 2014; Abd El-Hamid et al., 2013), a PMS prevalence rate of 66% was found suggesting a higher incidence than the global average on 47.5% (Direkvand-Moghadam et al., 2014). The results of the present study showed no significant statistical difference between PMS and the non-PMS women in terms of their background socio-demographic data, occupational history, and menstrual data. Both group mean age of menarche was consistent with the average age of menarche in Egypt (12.8 years) (Roushdy et al., 2011). Also, the menstrual cycle length range and duration of menses were fluctuating in the normal range and close to other previous study results (Nooh, 2014; Zegeye et al., 2009; Gumanga and Kwame-Aryee, 2012). The present study finding of a high prevalence of PMS was unlikely, therefore, to be due to differences in these factors.

All symptoms within each symptom type (psychological, behavioural or physical) were statistically significantly

higher among the PMS sample compared to the non-PMS women. This was expected given the nature of PMS. Of these symptoms, tiredness was the most frequently experienced symptom among PMS cases. This finding is similar to another study Egyptian university sample, which showed fatigue as the highest frequency of PMS symptom among medical students (93.9%) (Bakr and Ez-Elarab, 2010). Female medical students in Iran have also been found to report fatigue as the most prevalent PMS symptom (Pakmehr and Hagh-Shenas, 2011). Other dominating symptoms in the present study include the physical or somatic symptoms of back pain breast tenderness, musculoskeletal pain, headache and abdominal bloating. To a lesser degree, the psychological and behavioral symptoms among our PMS group (in addition to fatigue) were anxiety, insomnia and irritability, respectively. Again, these results are similar with other previous studies in different countries revealing somatic symptoms to be more prevalent than psychological symptoms (Tolossa and Bekele, 2014; Abd El-Hamid et al., 2013; Pakmehr and Hagh-Shenas, 2011; Balaha et al., 2010).

In terms of symptoms affecting social activities and relationships, women with PMS studied here showed significantly greater impairment than the non-PMS (apart from relationship with co-workers). Kitamura et al., (2012) also found that women who met PMS criteria reported significantly impairment in social activities and hobbies. It could be that the results found in the present study on Egyptian women may reflect similar consequences and coping mechanisms to Western women. For example, previous literature has indicated that women who experience premenstrual changes can use social withdrawal as means of coping. Such so called 'maladaptive' premenstrual coping processes can appear in such forms as social withdrawal and avoidance of situations (Read et al., 2014). These withdrawals and avoidances may explain what was found in the sample studied here. Future research exploring the specific reasons why relationships and activities are affected in this way would be a useful exercise. They may even go some way to provide insight into why prevalence rates are higher in this population.

The results of the present study also found highly statistically significant differences between PMS and non-PMS studied women groups regarding the effect of premenstrual symptoms on their work capacity, symptoms worsened by work, and job performance. In particular, psychological and physical symptoms seem to be the most important with respect to work capacity and perceiving work making symptoms worse. Reduced work performance or productivity has been shown in previous studies (e.g. Sut and Elcin, 2015) but this study provides empirical evidence of similar effects among the studied population.

Schmelzer et al., (2015) have reported that women with PMS are more likely to have a high productivity loss. The women with PMS reported work-related interference and impairment; they also reported that the severity of psychological symptoms was correlated with occupational impairment. This matches the results of the current study where the psychological symptoms were the most significant predictor for impairment of work capacity and work performance. The findings of this study

supports the findings of Schmelzer et al., (2015) that confirmed the noticeable role of premenstrual affective symptoms and support classification guidelines focusing on both affective and physical changes.

It is argued that PMS can lead some women to experience high sensitivity to different external stress and emotions, which can make normal life responsibilities more troublesome than usual (Read et al., 2014). It could be that work-related stress, the quality of the work environment, non-cooperative work organization and other work stresses (in addition to any other life stresses) could be contributing to these adverse effects on work capacity and job performance, and explain the results of work being perceived as making symptoms worse with PMS symptoms. The study results showed that the physical symptoms were the significant predictor for symptoms worsened by work. This result is mostly attributed to the poor physical work environment, lack of refreshing and rest facilities at work, unsuitable workplace design and work organization which were reported in a previous study by Hammam et al.,

(2012) in the same workplace setting. Future research investigating the work environments of women with PMS may help to understand this further as well as reveals ways that women and employers could help working women with PMS and reduce both the impact of and on work.

The results of this study also showed that the monthly income was a predictor for both work performance and level of coping at work. Okurame, (2014) examined the influence of demographic variables on career prospective among a sample of African population revealed that the basic monthly income is a significant predictor for career progress prospective. This result is matched with the results of our study where income affects both work performance and coping and consequently will affect the career of the working women.

Several limitations of this study should be noted at this point. Although prospective ratings of symptoms were used, the other variables were collected retrospectively meaning that the accuracy of the results could be impaired due to memory distortion or error. Data was also self-rated meaning

that women with PMS may perceive their performance, for example, as impaired but if measured objectively it may not mirror this perception. Another limitation was the required two consecutive month premenstrual daily symptom diary. This requires a lot of effort and commitment by the participant to complete. This may have been unappealing to potential participants and in turn affected our response rate and potentially the generalizability of the results. Relating to this, as the study was about PMS, it is possible that more women with PMS were interested to volunteer and complete the daily symptom diary than those without PMS. This may have skewed the proportions and led to the higher prevalence rates observed.

It is important that employers and occupational health professionals, to be aware of the impact that PMS can have on female employees. In addition, the potential impact that works can have on the premenstrual symptoms experienced by employees. Making health and safety programs about this topic available to all female staff, which could serve to raise self-awareness and provide

information about treatment options and coping strategies. It could also provide a way for employees experiencing difficult symptoms the opportunity to communicate with their employer and discuss ways in which the job and work environment could be adapted to help these women. Implementation of such work health strategies may improve both psychological and physical health status of these females that in turn could affect their work performance and productivity in a positive way.

Conclusion

This study revealed high prevalence of PMS among a sample of female academic teaching staff in Zagazig University, Egypt. PMS symptoms impact on these women's social and working lives, including their work capacity and job performance, similar to Western female populations. Women with PMS also perceived their work environment to make some of their premenstrual symptoms worse. Interestingly, over half of the sample found co-worker relationships were impaired due to their premenstrual symptoms. Employers, occupational health professional, as well as policy

makers could play a role in helping women with bothersome premenstrual symptoms manage symptoms at work in order to reduce their impact. The results are also of interest to researchers as it supports findings that a women sample from Zagazig Governorate has higher prevalence rates of PMS. Cultural factors could play a role here but more research into this population is needed to understand this further. The results found in the present study also suggest several key areas where targeted interventions may be of benefit (e.g. toward psychological symptom management and work). Given that impaired work outcomes not only impact these women individually but have wider implications and economic costs, more research to understand the impact of, and influence on PMS within the work context across different cultures is important and more effective interventions may be developed to help this population.

Conflict of interest

Authors declared that there is no conflict of interest.

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