Original Article

The Impact of COVID-19 on Premenstural Tension Syndrome Among Qalyoubia Governorate Physicians, A Cross Sectional Study

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ABSTRACT

Background: The late luteal phase of a woman's menstrual cycle is associated with a collection of a variety of mood-related, physical, and behavioral symptoms that are referred to together as premenstrual symptoms. The purpose of this research was to investigate whether or not there is a correlation between COVID-19-induced premenstrual symptom syndrome (PTSS) and premenstrual symptoms in Japanese high school students.

Material and Methods: A cross sectional study hospital based study via cluster sampling technique Qalyoubia governorate, Egypt (from Jan 5 to March 21, 2022) was conducted. Two hospitals (sampling unit) were chosen randomly, all non -pregnant female physicians in child bearing period (15-49 years), of different departments in the selected hospitals were invited to participate in the study.

Results: Our data and work indicate that there is increase in PMS .PMDD during the pandemic among the studied group, these changes were linked to psychological stress related to the covid pandemic. Our study showed a relation between front line work and the post traumatic stress symptoms this is in line with previous studies in literature that suggest worsening of PMS symptoms during stressful events, no one can deny that front line work is more stressful than those on the second line which confirm the role of stress in these events. When we compared the difference in mean premenstrual symptoms total score and intensity of menstrual pain our study confirmed the relation in the group of PTSS. According to the results of regression analysis there was a correlations of significance between BMI and FCV-19 score and a correlations of high significance between intensity of menstrual pain and IES-R score of the study group characteristics and the total premenstrual score.

Conclusion: In the era of covid many aspects of life has been changed, covid not only affect the general health but also many aspects of affection of menstrual pattern and premenstrual tension , social life has been affected deeply by covid. its negative impact should be dealt with .in this study we examined the psyclogical distress effects of covid on female physicians and its negative impact on premenstrual tension among and there social life affection.

Key Words: COVID-19, Impact, physicians, Premenstural tension syndrome.

INTRODUCTION

A condition of psychological or biological tension that causes disruption to normal physiology is referred to as stress. The body responds physiologically to stressful stimuli by activating a network of interconnected pathways, one of which is the neuroendocrine system. The hypothalamic–pituitary–adrenal (HPA) axis is one of the primary circuits targeted by the stress response. This leads to an increased level of cortisol, which in turn has negative consequences on a variety of processes throughout the body. In addition, stress may impair natural immunity by stimulating the hypothalamic–pituitary–adrenal (HPA) axis in addition to the sympathetic–adrenal–medullary (SAM) axis[1].

The menstrual cycle is a physiological process that consists of a number of psychological, social, and biological components[2].

The late luteal phase of a woman's menstrual cycle is associated with a collection of a variety of mood-related, physical, and behavioral symptoms that are referred to together as premenstrual symptoms[3,4]. PMDs are a more comprehensive term that includes both premenstrual syndrome (PMS) and premenstrual dysphoric disorder (PMDD)[5]. Epidemiologic research have shown that premenstrual symptoms have a high overall incidence in the general population (80 percent -90 percent)[6].

According to the Diagnostic and Statistical Manual of Mental Disorders (DSM), PMDD is a severe type of

PMS that is primarily distinguished by its significant mental symptoms[7]. PMDD is also known as premenstrual dysphoric disorder. Between the ages of puberty and menopause, PMDs have a significant and detrimental impact on the quality of life of women.

The symptoms of premenstrual syndrome (PMS) are known to cause interruptions in everyday activities, occupations, educational pursuits, and social connections[2,8,9]. During the COVID-19 pandemic, Salari *et al*. found that 29.6 percent of the world's population suffered stress, 31.9 percent experienced anxiety, and 33.7 percent experienced depression[10].

A stressful experience may lead to a condition known as posttraumatic stress disorder (PTSD), which is an anxiety disorder. Women are more susceptible to experiencing posttraumatic stress symptoms (PTSS) than males are, since they are more sensitive to the effects of traumatic experiences[11].

Previous research that evaluated the effects of COVID-19 on mental health found that several factors, including having infected friends or relatives, being placed in quarantine or lockdown, having financial problems, wearing masks, routinely checking temperature, being female, and not knowing what the future holds, are associated with a greater risk of developing mental disorders[12–16]. According to the findings of a research that was carried out in China on foreign women, around one quarter of international women suffer from dysmenorrhea, and one third of international women report having symptoms of PMS. According to the findings of the research[17], the elevated stress levels connected with foreign relocation were linked to menstruation abnormalities.

The purpose of this research was to investigate whether or not there is a correlation between COVID-19-induced premenstrual symptom syndrome (PTSS) and premenstrual symptoms in Japanese high school students.

METHODOLOGY

Settings and participants

A cross sectional study hospital based study via cluster sampling technique Qalyoubia governorate, Egypt (from Jan 5 to March 21, 2022) was conducted. Two hospitals (sampling unit) were chosen randomly, all non -pregnant female physicians in child bearing period (15-49 years), of different departments in the selected hospitals were invited to participate in the study.

The target sample size of participants was calculated using open Epi program version 3.01, setting the type-1 error (α) at 0.05 and margin of error 5%. Result from previous study[18], showed that 5.6% of females had PTSS after Covid 19. Calculation according to these values produced a minimal sample size of 82 cases, taking dropout rate, and using the formula; $N = Z\alpha 2P(1 − P)/d2$, in which $\alpha = 0.05$ and $Z\alpha = 1.96$, and $d = 5\%$. The final sample size of the study was 138.

A section on giving informed permission was included in the survey, and prior to respondents' participation in the research, the investigation's design and purpose were explained in full. The participants were free to exit the survey at any point in time that they chose. Participants in the poll were not identified, and their privacy was protected at all times. At Benha University's Faculty of Medicine Research Ethics Committee, we were successful in getting their blessing before moving further.

Main Measures

A questionnaire was distributed to all female physician at both hospitals to collect data from all participant, that included some socio-demographics as age, place of work during Covid pandemic weather front line or second line, number of work years, work hours /day, weight and height.

Premenstrual symptoms were evaluated by Premenstrual Symptoms Questionnaire (PSQ)[19,20], The questions about premenstrual symptoms comprise 11 items that are scheduled in the DSM PMDD diagnostic standards. The PSQ begins by asking participants, "Within the last 3 months, have you experienced the subsequent premenstrual symptoms begining during the week before menses and stopping a few days after the onset of menses?".

In addition, the Premenstrual Symptoms Questionnaire (PSQ) inquires as to whether or not the premenstrual symptoms interfere with the respondent's ability to be effective or productive at work, as well as with their responsibilities at home, their participation in social activities, or their relationships with coworkers or family members On a scale from one to four, the intensity of premenstrual symptoms and the degree to which they disrupt a person's ability to participate in social activities are rated (1: Not at all; 2: Mild; 3: Moderate; or 4: Severe). The final score on the PSQ was calculated by adding together all 14 subscale scores. As a result, the overall score on the PSQ might be anywhere from 14 to 56.

A numerical rating scale (NRS)was used in order to assess the level of menstrual cramping On a scale from 0 (no pain) to 10, the participants rated the intensity of their discomfort (the worst pain imaginable).

In order to assess how frightening COVID-19 really is, we used the FCV-19S. We conducted research to determine the validity and reliability of the FCV-19S-J. The FCV-19S-J consists of 7 questions, each of which has a response format ranging from 1 to 5 points. There is a range of scores for the FCV-19S, from 7 to 35[21].

We used the IES-R to analyze the effects of COVID-19 on PTSS. The IES-R is comprised of 22 items, all of which measure PTSS linked to COVID-19, and each of these things is rated on a scale from 0 to 5. (0-4). As a result, the possible IES-R scores range from 0 to 88. It was shown that a cut-off point of 24/25 on the overall score may define PTSS[22].

An IES-R total score of 25 or above distinguished the post COVID-19-induced PTSS groups from the non-PTSS groups. The non-PTSS groups were well-defined by an IES-R total score of 24 or less. Also, information about premenstrual symptoms was obtained from each participant before the pandemic; however, only 132 of the participants completed the PSQ before the pandemic.

Statistical analysis

SPSS version 21 (IBM, Armonk, New York, United States) and JMP Pro 15.2.0 were used for the purposes of managing data and doing statistical analysis, respectively (SAS, Cary, NC, USA). the presentation of categorical data using numerical values and percentages. The mean and standard deviation were the parameters used to determine the quantitative parameters. The Student's t-test and the Pearson's chi-square test are used in order to ascertain whether or not there is a correlation between qualitative and qualitative variable variables. The ANOVA test and the Tukey post hoc comparison test were used to determine whether or not there were significant differences in the overall PSQ score and the NRS score between the pre covid group, the non-PTSS group, and the PTSS group. The Steel-Dwass test was used in order to determine whether or not there were significant group differences in each premenstrual symptom. In order to investigate the relationships that existed between the sample characteristics and the overall PSQ score, multiple linear regression was used. The threshold for statistical significance was established at P less than 0.05..

RESULTS

Demographic characteristics and prevalence of PTSS

The demographic characteristics of studied group are presented in Table 1. PTSS represent (34.8%) but non-PTSS represented 62.2 % of studied participant. Severity of pain was more in PTSS group ,also mean FCV-19 score and IES-R score was higher in studied group (7.35, 25.77 and 44.75) respectively, compared to non- PTSS group (4.82, 15.12 and 11.13)respectively (Table 1).

Comparison between before Covid19 and after Covid 19 group (PTSS and non- PTSS) regarding premenstrual symptoms and intensity of menstrual pain

The total PSQ score was significantly higher in the PTSS group than in the non-PTSS group and before Covid 19 group (Table 2, Figure 1), also severity of menstrual pain was significantly higher in PTSS than non-PTSS group and before Covid 19 group (Table 2, Figure 2).

Comparison of each premenstrual symptom between PTSS, non- PTSS and before Covid 19 revealed that severity of all PSQ items was significantly higher in the PTSS group than in the non- PTSS group except decreased interest in work, home, or social activities. Compared to before Covid 19 group, PTSS group showed more severe symptoms for all menstrual symptoms but non PTSS group showed more severe symptoms in depressed mood, tearful and interference with work efficiency or productivity, home responsibility, social life activities and relationships with coworkers or family (Table 3)

To assess the association between premenstrual symptom severity and PTSS multiple regression analysis was performed (Table 4). BMI, intensity of menstrual pain, FCV-19 score and the IES-R score were associated with thetotal PSQ score. The results of the variance inflation factorshowed that there was no multicollinearity problem in thisanalysis (1.04 to 2.59) (Table 4)

Table 1: Characteristics of studied group

Characteristics	N=138 (No %)		PTSS N=48 (34.8 %) (No %)		Non-PTSS N=90 (65.2) (No %)		*p-value*
Age in years (mean± SD)	35.66 ±4.59		33.81 ±4.03		36.64 ±4.59		0.001**
Place of work during Covid 19pandemic							
- Front line	57	21.1	36	75	21	23.3	0.001**
- Second line	81	30	12	25	69	76.7	
(No %)							
Numbers of work years (No %)							
1-5 years	27	10	12	25	15	16.7	
6-10 years	18	6.7	9	18.8	9	10	0.116
>10 Years	93	34.4	27	56.3	66	73.3	
(No %)							
Average numbers of work hours / day (No %)							
<8	71	26.3	47	52.2	24	50	
8-12	42	15.6	33	36.7	9	18.8	0.006**
>12	25	9.3	10	11.1	15	31.3	
(No %)							
BMI mean± SD	29.86 ±4.27		29.97 ±4.62		29.79 ±4.09		0.808
Age at menarche in years (mean± SD)	9.55 ±2.34		12.23 ±1.63		8.12 ±1.04		0.001**
Intensity of menstrual pain	2.73± 0.88		7.35 ±2.30		4.82 ± 2.24		0.001**
FCV-19 score (mean± SD)	18.83 ±6.21		25.77 ±3.9		15.12 ±3.38		0.001**
IES-R score (mean± SD)	22.83 ±18.88		44.75 ±13.96		11.13 ±6.95		0.001**

**Highly significant.
PTSS, posttraumatic stress symptoms; SD, standard deviation; BMI, body mass index; FCV-19S, Fear of COVID-19 Scale; IES-R, Impact of Event Scale-Revised version.

Table 2: Compares diferrence in mean premenstrual symptoms and menstrual pain in before and after covid 19 groups

Charecteristics	Before covid N=132	PTSS N= 48	Non- PTSS N=90	F test[*]	*p-valus*[***]
Prementrual symptoms total score (mean± SD)	27.4 ±6.19	39.35±4.88	30.47±7.78	59.6	0.001**
Intenisity of menstrual pain (mean± SD)	3.61 ±1.77	7.35 ±2.3	4.82 ±2.24	57.7	0.001**

*F test = One Way Anova
**Highly significant
***Tukey post hoc comparison test conducted and revealed significant difference between all groups

Table 3: Compares premenstrual symptom in PTSS, non PTSS and before covid 19 groups

Charecteristics		Not at all		Mild		Moderate		Severe		PTSSvs Non PTSS	PTSS vs Before covid 19 group	Non PTSS vs Before covid 19 group
		No	%	No	%	No	%	No	%			
Depressed mood	-PTSS	0		9	18.75	15	31.25	24	50			
	-Non-PTSS	7	7.78	37	41.11	3	6 40	10	11.11	0.001**	0.001**	0.038*
	-Before Covid 19	26	19.52	55	41.67	41	31.06	10	7.85			
Anxiety or tension	-PTSS	1	2.08	2	4.17	17	35.24	28	58.33			
	-Non-PTSS	10	11.11	38	42.22	29	32.22	13	14.44	0.001**	0.001**	0.17
	-Before Covid 19	28	21.21	55	41.67	31	23.48	18	13.64			
Tearful	-PTSS	3	6.25	12	25	18	37.5	15	31.25			
	-Non-PTSS	37	41.11	32	35.56	8	.89	13	14.44	0.001**	0.001**	0.033*
	-Before Covid 19	58	44.12	54	40.91	17	12.88	3	2.27			
Anger or irritability	-PTSS	0		10	20.83	31	64.58	7	14.58			
	-Non-PTSS	1	1.11	41	45.56	42	46.67	6	6.67	0.001**	0.001**	0.45
	-Before Covid 19	6	4.58	61	46.56	62	47.33	2	1.53			
Decreased interest in work, home or socialactivities,	-PTSS	0		12	25	28	58.33	8	16.67			
	-Non-PTSS	16	17.78	24	26.67	31	34.44	19	21.11	0.18	0.006**	0.49
	-Before Covid 19	24	18.18	41	31.06	51	38.64	16	12.12			
Difficulty concentrating	-PTSS	1	2.08	12	25	28	58.33	7	14.58			
	-Non-PTSS	19	21.11	42	46.67	24	26.67	5	5.56	0.001**	0.001**	074
	-Before Covid 19	34	25.75	57	43.18	38	28.79	3	2.27			
Fatigue or lack of energy	-PTSS	1	2.08	8	16.67	22	45.83	17	35.42			
	-Non-PTSS	3	3.33	40	44.44	34	37.78	13	14.44	0.001**	0.001**	0.099
	-Before Covid 19	19	14.4	54	40.91	49	37.12	10	7.58			

P (Steel Dwass test)

		n	%	n	%	n	%	n	%	p	p	p
Overeating or food cravings	-PTSS	1	2.08	11	22.92	26	4.17	10	0.83	0.001**	0.001**	0.052
	-Non-PTSS	23	25.56	29	32.22	29	32.22	9	10			
	-Before Covid 19	40	30.31	39	29.55	49	37.12	4	3.03			
Insomnia or hypersomnia	-PTSS	1	2.08	9	18.75	32	66.67	6	12.50	0.001**	0.001**	0.411
	-Non-PTSS	19	21.11	34	37.78	28	31.11	9	10			
	-Before Covid 19	35	26.52	47	35.61	49	37.12	1	0.76			
Feeling overwhelmed	-PTSS	2	4.17	12	25	25	52.08	9	18.75	0.001**	0.001**	0.99
	-Non-PTSS	31	43.44	28	31.11	24	26.67	7	7.78			
	-Before Covid 19	43	32.57	41	31.06	41	31.06	7	5.30			
Physical symptoms such as tender breasts,feeling of bloating, headache,joint or musclepain, weight gain'.	-PTSS	4	8.33	4	8.33	32	66.67	8	16.67	0.001**	0.001**	0.778
	-Non-PTSS	13	14.44	50	55.56	22	24.44	5	5.56			
	-Before Covid 19	31	23.49	56	42.42	45	34.09	0				

Interference with work, usual activities, relationships, or athletic performance

		n	%	n	%	n	%	n	%	p	p	p
Work efficiency or productivity, home responsibility.	-PTSS	1	2.08	7	14.58	22	45.83	18	37.50	0.001**	0.001**	0.045*
	-Non-PTSS	17	18.89	39	43.33	26	28.89	8	8.89			
	-Before Covid 19	42	31.82	52	39.39	37	28.03	1	0.76			
Social life activities	-PTSS	4	8.33	8	16.67	26	54.17	10	20.83	0.001**	0.001**	0.02*
	-Non-PTSS	11	12.22	43	47.78	29	32.22	7	7.78			
	-Before Covid 19	34	25.76	59	44.70	39	29.55	0				
Relationships with coworkers or family	-PTSS	3	6.25	9	18.75	21	43.75	15	31.25	0.01*	0.001**	0.02*
	-Non-PTSS	10	11.11	30	33.33	38	42.22	12	13.33			
	-Before Covid 19	30	22.73	45	34.09	50	37.88	7	5.30			

*Significant
** Highly significant
ᵝ, regression coefficient; CI, confidence interval; VIF, variance inflation factor; MI, body mass index; FCV-19S, Fear of COVID-19 Scale; IES-R, Impact of Event Scale-Revised version

Table 4: Multiple regression analysis to assess the associations between studied group characteristics and the total premenstrual score

Charecteristics	β	95% CI	Standardized β	P-value	VIF
Age	-0.237	-0.07-0.548	-0.135	0.13	1.7
Speciality	-0.85	-3.48-1.76	-0.052	0.52	1.39
Age at menarche	-0.57	-0.15-1.3	-0.16	0.119	2.4
Number of work Years	-0.32	-1.9-1.3	-0.003	0.71	1.52
Average number of work hours/day	0.045	-1.58-1.49	0.004	0.95	1.17
BMI	0.342	0.036-0.62	1.80	0.01*	1.18
Intenisity of menstrual pain	0.98	0.48-1.48	0.31	0.001**	1.37
FCV-19 score	0.44	0.11-0.77	0.34	0.01*	2.59
IES-R score	0.29	0.14-0.08	0.26	0.001**	1.04

*Significant
** Highly significant
β, regression coefficient; CI, confidence interval; VIF, variance inflation factor; MI, body mass index; FCV-19S, Fear of COVID-19 Scale; IES-R, Impact of Event Scale-Revised version

DISSCUSION

This study is one of the first studying the cumbersome effects of covid 19 pandemic on PMS and the negative impact of covid with its various effets. Our data and work indicate that there is increase in PMS. PMDD during the pandemic among the studied group ,these changes were linked to psychological stress related to the covid pandemic.

The hypothalamic–pituitary–gonadal (HPG) axis is controlled by psychological stress, which has the effect of inhibiting the release of sex hormones and stimulating hypothalamic–sympathetic–neural pathways, both of which result in an increase in the amount of norepinephrine that is secreted by the ovary. The primary proposed mechanism behind premenstrual syndrome is a change in the levels of reproductive hormones that occurs throughout the course of a woman's monthly menstrual cycle. It is possible that the COVID-19 pandemic, together with other stresses that have been detected, may cause disruptions in the HPG axis and neural circuits[25].

Our study showed a relation between front line work and the post traumatic stress symptoms this is in line with previous studies in literature that suggest worsening of PMS symptoms during stressful events , no one can deny that front line work is more stressful than those on the second line which confirm the role of stress in these events .in consistence with other studies from the literature late age of menarche 12.23 ±1.63 associated with PTSS rather than early age of menarche we are In line with the study carried out by Topatan and Kahraman, the mean age of first menstruation was 13.32±1.36[26]

When we compared the difference in mean premenstrual symptoms total score and intensity of menstrual pain our study confirmed the relation in the group of PTSS

In accordance with our results, a number of earlier research that were published in the scientific literature revealed that menstruation disorders may lead to a deterioration in the mental state of the afflicted female. A handful of research have been conducted to study the connection between premenstrual syndrome (PMS) and the mental health of female medical students in Iran and Saudi Arabia. Both studies found that women who suffered from PMS had greater symptoms of sadness, anxiety, and stress than women who did not have PMS.. This study confirmed the association of depressed mood ,anxiety and tension decreased interest in work ,difficult concentration in the group of PTSS[23]. Therefore, it is important to increase PMS awareness in adolescents and how to avoid its negative impact on their mental health.

It is noteworthy with our study that there were interference with work efficiency productivity and social life activities and also the relationships with coworkers or family which confirm the social effects of covid on whom with PTSS, Balaha et al also has the same result[24,25].

According to the results of regression analysis there was a correlations of significance between BMI and FCV-19 score and a correlations of high significance between intensity of menstrual pain and IES-R score of the study group characteristics and the total premenstrual score.

The present study wasn't without limitations it was carried out at Qalyoubia governorate only on a small sample to some extent so this study does not aim to generalise results to the population as a whole and also only physicians was enrolled in the study no other stressful jobs was employed in this study.

CONCLUSION

In the era of covid many aspects of life has been changed, covid not only affect the general health but also many aspects of affection of menstrual pattern and premenstrual tension , social life has been affected deeply by covid . its negative impact should be dealt with .in this study we examined the psyclogical distress effects of covid on female physicians and its negative impact on premenstrual tension among and there social life affection .

CONFLICT OF INTERESTS

There are no conflicts of interest.

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