Behavioral Psychology / Psicología Conductual, Vol. 31, Nº 3, 2023, pp. 479-500
https://doi.org/10.51668/bp.8323303n

COGNITIVE VULNERABILITY TO DEPRESSION OR OVERESTIMATION OF PREMENSTRUAL DYSPHORIC SYMPTOMS?

Cristina Senín-Calderón[1], Maria Claudia Scurtu[2], Celia Ceballos-Munuera[2,3], Salvador Perona-Garcelán[3] and Juan Francisco Rodríguez-Testal[2]
[1]University of Cádiz; [2]University of Seville; [3]University Hospital Virgen del Rocío, Seville (Spain)

Abstract

True premenstrual dysphoric disorder (PMDD) is hard to diagnose. It has been suggested that women's expectations influence the symptoms of this disorder, which could increase their vulnerability to depression. This study aimed to estimate PMDD in a group of women by comparing their self-diagnosis with clinical evaluation; differentiate between PMDD symptoms and their intensity and its subthreshold form, determining its social-employment and relational consequences, finding differences in symptoms and vulnerability to depression; and identifying possible cognitive vulnerability to depression in PMDD. 105 women participated, 85 from the general population and 20 women with Major Depressive Disorder were selected. For the self-diagnosis, they filled out several self-reports and PMDD Criteria Indicators A, B, C (APA) and D (by author). The clinical diagnosis was made using a semi-structured interview following DSM-5 criteria. PMDD was overestimated when it was self-reported (51,76%) compared to clinical evaluation (5,88%). Therefore, retrospective and self-reported evaluation could bias what they remember and overestimate the indicators of the disorder and their severity. Cognitive vulnerability to depression for PMDD was not supported.

KEY WORDS: *premenstrual dysphoric disorder, cognitive vulnerability, subthreshold, major depressive disorder, premenstrual symptoms*.

Resumen

Es difícil estimar la verdadera presencia del trastorno disfórico premenstrual (TDPM). Las expectativas de las mujeres influyen en los síntomas del TDPM, lo que podría aumentar su vulnerabilidad a la depresión. Este estudio pretendió estimar la presencia de TDPM en un grupo de mujeres comparando su autodiagnóstico con la evaluación clínica; diferenciar los síntomas y su intensidad entre TDPM y su forma subsindrómica, así como determinar sus consecuencias sociolaborales y relacionales. Se analizan las diferencias entre TDPM y trastorno depresivo mayor

Correspondence: Juan Fco. Rodríguez-Testal, Personality, Evaluation and Psychological Treatment Dept., Faculty of Psychology, University of Seville. St./ Camilo José Cela, s/n, 41018 Seville (Spain). E-mail: testal@us.es

(TDM) identificando una posible vulnerabilidad cognitiva a la depresión. En un diseño *ex-post facto*, participaron 105 mujeres, 85 de la población general (M_{edad}= 23,60; *DT* 3,05) y 20 mujeres con TDM, (M_{edad}= 25,15; *DT* 3,51). Para el autodiagnóstico, completaron varios autoinformes y los indicadores de criterios TDPM A, B, C (APA) y D (por autor). El diagnóstico clínico se realizó mediante entrevista semiestructurada siguiendo los criterios del DSM-5. El TDPM se sobreestimó cuando fue autoinformado (51,76%) contrastando con la evaluación clínica (5,88%). La vulnerabilidad cognitiva a la depresión para el TDPM no fue apoyada.
PALABRAS CLAVE: *trastorno disfórico premenstrual, vulnerabilidad cognitiva, trastorno depresivo mayor, síntomas premenstruales.*

Introduction

Women at a fertile age usually report changes in mood before their menstruation starts, and it is estimated that 30-40% experience symptoms of what is called Premenstrual Syndrome (PMS) (Green et al., 2017; Osborn, Wittkowski et al., 2020; Prasad et al., 2021; Ryu & Kim, 2015). This condition is characterized by physical, psychological and emotional symptoms that occur in response to hormonal changes during the luteal phase of the menstrual cycle and disappear in the first days of or during menstruation (Albsoul-Younes et al., 2017; Izadi & Amiri, 2019). Some women experience more severe clinical symptoms, which when severe depression and anxiety characterized by dysphoria and irritability predominate, is diagnosed as Premenstrual Dysphoric Disorder (PMDD). This disorder causes strong functional and social decline affecting quality of life and wellbeing (Cerqueira et al., 2017, Osborn, Wittkowski, et al., 2020; Prasad et al., 2021), may lead to psychotic episodes (Studd, 2012), and even suicide or attempted suicide (Osborn, Brooks, et al., 2020; Osborn, Wittkowski, et al., 2020; Pilver et al., 2012).

The premenstrual stress syndrome first classified by Frank in 1931 as a non-specific depressive disorder, is presently classified in the DSM-5 (APA, 2013, 2022) as PMDD. This diagnostic category continues to generate controversy due to the possibility of medicalization of women's bodies (Browne, 2014; Hartlage et al., 2013). However, epidemiological research suggests that PMDD affects 3-8% of premenopausal women (Beddig & Kuehner, 2017; Dennerstein et al., 2009). Lifetime comorbidity with other mental disorders, in particular with depressive and anxiety disorders, is high; over 50% of women with PMDD are reported to have diagnoses associated with Major Depressive Disorder (MDD) (Beddig et al., 2019; Cohen et al., 2002). More complicated is the characterization of subthreshold manifestations, which although more usual, have fewer characteristic symptoms or symptoms that impact less on functioning.

One of the problems inherent in PMDD is its evaluation. In spite of recurrent use of retrospective self-diagnosis, the results may be overestimated and differ from their daily evaluation (and in different menstrual cycles) hindering accurate

identification of the disorder (Henz et al., 2018; Nogueira Pires, & Calil, 2000). Memory biases may be influencing this, and although retrospective self-diagnosis may serve as a first evaluation of the importance of the difficulties experienced by these women, it does not permit the variability of the symptoms to be analyzed, nor is it useful as an approach to its etiology or usefulness of treatments. However, a review of the literature comparing PMDD evaluation procedures suggests that daily records over several cycles, paradoxically, do not facilitate more consistent results (Bosman et al., 2016). In addition to these problems, more classic studies have tried to find out whether the expectations of the evaluation itself could have some role in the symptoms. Although this effect was not demonstrated for the severity of its manifestations, it was with the number of cycles recorded (Gallant et al., 1992). The question is therefore not fully resolved and must be kept in mind in evaluating the disorder.

The definitive etiology of PMDD continues to be hard to pinpoint (Raffi & Freeman, 2018), although considered multifactorial (Beddig et al., 2019; Izadi & Amiri, 2019; Yan et al., 2021). The latest findings propose its consideration as a disease requiring medical attention and intervention (Cunningham et al., 2009; Raffi & Freeman, 2018). In fact, in 2019, the World Health Organization included PMDD in the eleventh edition of its classification (ICD-11) as a genitourinary tract disease (Reed et al., 2019). These different classifications of PMDD, as a psychiatric condition in the DSM-5 and as a medical condition in the ICD-11 illustrate the difficulty of integrating physical and mental conditions. In the absence of a definitive biological marker for PMDD, the diagnosis is based on the knowledge and experience of the healthcare professionals who treat it (Osborn, Wittkowski, et al., 2020).

Cognitive vulnerability to depression is considered an important factor in the etiology of depressive disorders and comprises cognitive processes such as negative cognitive styles, dysfunctional attitudes, rumination and cognitive reactivity (Ingram et al., 2011). Beck's cognitive model argues that vulnerability to depression is marked by schemas or dysfunctional attitudes such as the need to achieve emotional dependence or not (Beck, 1967). The facility with which dysfunctional attitudes are activated in stressful situations or mild dysphoria has traditionally been evaluated using the change in scores on the Dysfunctional Attitudes Scale (DAS, Weissman & Beck, 1978) before and after being subjected to negative mood induction. PMDD is an expression of depressive disorders, and therefore, as some researchers suggest, cognitive vulnerability as a factor in proneness to it would be compatible, and attribution and coping styles seem to have a role in the expression of the disorder's symptoms and severity (Sigmon, et al., 2004). Indeed, women who suffer from severe premenstrual symptoms seem to perceive more chronic stress (Kleinstäuber et al., 2016). At the same time, an abnormal response to sexual hormone fluctuations is a constant finding among women who experience mood disorders related to these hormones, reinforcing the hypothesis of certain "vulnerability windows" during the reproductive life cycle

(Reid & Soares, 2018; Soares & Zitek, 2008). Given the considerable burden of PMDD on women's functioning, and their emotional and general wellbeing, it is an important direction for health research, which would be expected to find signs of cognitive vulnerability to depression, although it is unknown whether to some particular form of dysfunctional attitudes covered by the DAS, the instrument most commonly used for its evaluation.

This study posed the following objectives: Estimate the presence of PMDD by self-diagnosis; differentiate between the symptoms and intensity of PMDD and its subthreshold form and identify its social-employment and relational consequences; study the differences between PMDD and MDD in depressive symptoms and vulnerability; compare the presence of PMDD found by self-diagnosis with clinical evaluation; and finally, identify the differences between PMDD and MDD, identifying possible cognitive vulnerability to depression in PMDD.

The following hypotheses were proposed for this: 1) Greater presence of PMDD is observed in women's self-diagnosis than in clinical observation; 2) there are stronger differences in symptoms and their intensity in the PMDD group than in the subthreshold group, or finally, in the control group; 3) there are more social-employment and relational consequences for women with PMDD 4) Less intense depression and anxiety symptoms are observed in cases of PMDD than in MDD; 5) a cognitive vulnerability to depression is observed in PMDD with a different profile than in MDD; and 6) more cognitive vulnerability to depression is observed in the premenstrual period of the cycle.

Method

Participants

A sample of 105 women was selected, 85 of whom were from the general population recruited after answering an ad about a study related to menstruation (University of Seville, Spain). This ad informed of the possibility and interest in research in the characteristics of changes in psychological functioning during the premenstrual period, to be conducted in a university context, and gave a general description (not pathological) of menstruation and the premenstrual period. The sample's mean age was 23.60 (*SD*= 3.05), and they were mostly single (93.95%) and middle class (social class index [SCI]) (*M*= 36.82, *SD*= 22.86) (Hollingshead, 1975). The remaining 20 women were from a clinical psychology center: Mean age was 25.15 (*SD* 3.51); most of them were married (45%) or single (40%), and middle social class (SCI *M*= 32.42, *SD*= 17.13).

Inclusion criteria: Regular menstruation, no oral contraceptives, no alcohol or other drug abuse, age 18 to 35, no current mental diagnosis or disorder, no genitourinary-related tract or chronic disease that could affect menstruation, and six points or more on the sincerity scale (S-EPI). In the MDD group, in addition to the above criteria, the conditions for participation were not having started

therapeutic intervention, not taking antidepressants or neuroleptic medication at the time of evaluation, and meeting the F32.x diagnostic criteria for major depressive disorder, single episode, 296.2x, at any level of severity (mainly mild).

Instruments

a) *Daily Record of Premenstrual Dysphoria (Registro Diario para la Disforia Premenstrual*, RDDP; Rodríguez-Testal, 2021). The RDDP includes, on the one hand, 16 items that collects demographic data, characteristics of menstruation (volume of menstrual bleeding, pain), oral contraceptives, past or present illnesses or psychological disorders, medication for any illness and/or menstruation, type and frequency of drug use; and, on the other hand, 33 items related to criteria A, B, C, and D premenstrual dysphoric disorder criteria (APA, 2013). The answer format is Likert-type from 0-10 points in intensity. This self-diagnosis was administered first to collect general data on their menstruation and initial retrospective evaluation. Later, those items related to Premenstrual Dysphoric Disorder (evaluating frequency or intensity of the indicators on a scale of 0-10) were applied during the clinical interview.
b) *Sincerity Scale*, *Eysenck Personality Inventory Subscale* (S-EPI, Eysenck & Eysenck, 1990). The EPI assesses three characteristics of Eysenck's personality theory and includes an additional scale that measures sincerity in responses. In this study, only the sincerity subscale (S-EPI) was used, which consists of nine true/false items that evaluates the tendency to provide socially desired responses. Participants who scored below five were excluded.
c) *Beck Anxiety Inventory* (BAI; Beck et al., 1988), Spanish adaptation by Magán et al. (2008). The BAI is a self-report with 21 items from 0-3 points, for evaluating physical anxiety. The total score (from 0-63) can be obtained after directly adding the score of each item. The cut-off point to identify people with significant indicators of anxiety is set at 25.76 points The Spanish adaptation had a Cronbach's α of .93. Internal consistency was .89 in the groups related to menstruation, .88 in the MDD group, and .90 in the control group.
d) *Beck Depression Inventory* (BDI; Beck et al., 1979), Spanish version by Vázquez and Sanz (1997). The BDI is a self-report with 21 items with four statements on the intensity of depressive symptoms (from 0-3 points). The total scale score, that can range from 0-63 points, is obtained by summing all the items. The severity of depressive symptoms will be greater the higher the score (0-13, minimal depression; 14-19, mild depression; 20-28, moderate depression; and 29-63, severe depression) (Sanz et al., 2014). The Spanish validation had a Cronbach's α of .83 and validity (convergent and discriminant). In this study the internal consistency was .84 in menstruation groups, .92 in the MDD group, and .89 in the control group.

e) *Dysfunctional Attitudes Scale* (DAS; Weissman & Beck, 1978), Spanish version by Sanz and Vázquez (1993). The DAS is a self-report with 40 items for evaluating cognitive vulnerability to depression. It consists of a total score and three factors: Dependency (eight items on the need for others and their approval), Achievement (15 items on the need for success or achievement) and Autonomy (six items on the need for independence and personal sufficiency). Attitudes. The first two factors appeared on the original scale. The Autonomy factor was identified in the Spanish validation (Sanz & Vázquez) The answer format is Likert-type from 0-7 points. The Cronbach's α is .84 and validity is adequate. In the menstruation groups, internal consistency was .76, .83, .89, and .61 (for total DAS, Dependency, Achievement and Autonomy, respectively). In the MDD group it was .84, .80, .84, and .65 (for total DAS, Dependency, Achievement and Autonomy, respectively). In the control group it was .75, .85, .84, and .64 (or total DAS, Dependency, Achievement and Autonomy, respectively).

f) *Penn State Worry Questionnaire* (PSWQ; Meyer et al., 1990). The PSWQ assesses the general tendency to experience worry through 16 Likert-type items. The Spanish validation obtained adequate internal consistency (Cronbach's α= .90) as well as convergent and discriminant validity (Sandín, et al., 2009). In this study internal consistency was .86 in the menstruation groups, .85 in the MDD group, and .85 in the control group.

g) *DSM-5 Diagnostic Clinical Interview (APA, 2013*). Criteria A and B and indicators of criterion C were applied for the DSM-5 PMDD diagnosis (APA, 2013). Each symptom (out of 11) is noted by its intensity (0 to 10 points) and classified as: Absent [0], mild [1-3], moderate [4-7] and severe [8-10]. The most relevant physical symptoms are noted for criterion C: Sensitivity and increase in breast size, joint/muscular pain, digestive problems (swelling, diarrhea, constipation), and headache.

h) *Self-administered interview (by JFRT).* Based on criteria D indicators for the DSM-5 PMDD diagnosis (APA, 2013), it consists of a self-reported assessment of the frequency or intensity with which (pre)menstrual symptoms alter or interfere with a person's daily functioning. Responses follow a Likert-type scale of 0-10. Qualitatively it is qualified as: Absent [0], mild [1-3], moderate [4-7] and severe [8-10]. The indictors are: How much interference in daily life; how much interference with work; days unable to work due to premenstrual symptoms; days unable to work due to menstrual symptoms; days absent from work due to premenstrual symptoms; days absent from work due to menstrual symptoms; how much performance is lowered by premenstrual symptoms; how much performance is lowered by menstrual symptoms; days needed to recover adequate performance; how much extra effort is needed to perform tasks; how much it interferes with relations with others; how much social situations are avoided; how much confrontation with others.

Procedure

The study design was an ex post facto, cross-sectional group comparison, and prospective evaluation. The selection was not random (advertised at the university), and measures concerning the menstrual cycle were recorded, taking the participant herself as her own control in a prospective design addressing evaluation of depressive symptoms and vulnerability. The participants with MDD were selected by accidental sampling (from those attending a clinical psychology center). Scores concentrated on comparing depressive symptom and vulnerability self-report measures.

According to the measured variable, the following groups were assigned: PMDD group, at least five symptoms of a total of 11 indicators (criteria A, B and C) F32.81 Premenstrual Dysphoric Disorder (APA, 2013) and discomfort/interference (criterion D); subthreshold group; control group, none of the above conditions; and MDD group (F32.x diagnosis of Major Depressive Disorder, Single Episode 296.2).

In view of the difficulties in evaluating PMDD mentioned in the introduction, its evaluation consisted of two stages, taking as the first group variable the self-reported retrospective evaluation (PMDD criteria A, B, C and D) and focusing on the three menstruation groups. At this time, different measures were also compared, emphasizing those related to depressive symptoms and vulnerability, including a specific group of participants with MDD. A second stage of clinical interview enabled those cases meeting PMDD criteria to be identified, and from then on, daily records during three consecutive cycles were acquired with the BDI and DAS measures, to concentrate on prospective evaluation of vulnerability.

First evaluation (retrospective). The S-EPI, BAI, BDI, DAS-A, PSWQ self-report measures, and quantitative and qualitative indicators A, B, C (APA, 2013). Different measurements of anxiety and depression are therefore presented, mainly on depressive symptoms and vulnerability. PMDD Indicators A, B, and C span four related to dysphoria (e.g., marked affective lability or marked irritability) and seven on specific depressive symptoms (e.g., decreased interest in usual activities), including common physical symptoms (with four choices). PMDD criteria D (by author) was applied. This consisted of ten indicators of disturbance or interference with functioning due to (pre)menstrual symptoms. In the first retrospective evaluation, these PMDD indicators were in a self-reported true/false format (RDDP). This took about 50 minutes. In this first evaluation (self-report), 113 women took part, of whom 28 were discarded because they did not meet all the inclusion criteria. They did not differ in age, social class or marital status from the other 85 ($p > .05$). Based on this self-diagnosis, 44 were identified as possible cases of PMDD, 28 subthreshold and 13 controls, and labeled as the groups related to menstruation. The 20 women who attended the clinical psychology center were selected for their similarity to the 85 participants, but met the condition of having Major Depressive Disorder, and were not taking antidepressants at the time of

evaluation (25% were taking anxiolytics). These participants were selected with no psychiatric comorbidity that could confound results and had no problem related to menstruation to reduce the number of comparisons in the study. This group was included exclusively for comparison with means of depressive symptoms and vulnerability.

Second evaluation (clinical diagnosis and prospective analysis). This evaluation in the form of a structured interview following DSM-5 criteria (APA, 2013) for MDD and PMDD took about one and a half hours. It enabled confirmation of PMDD cases identified retrospectively. All evaluation was done by the same researcher (JFRT). During the interviews with the participants, the ten days before their menstrual period was estimated and they were asked to fill in the BDI and DAS for three consecutive cycles in the follicular and premenstrual period.

All the participants signed their informed consent for use of their data in research and did not receive any incentive for their participation. The study followed the Helsinki Declaration and was approved by the Ethics Committee.

Data analysis

Descriptive statistics: The SPSSwin 22.0 statistics package was used to evaluate frequency, percentage and chi-square (χ^2) for comparisons with nominal variables. The menstruation groups to be compared were formed in the first evaluation, identifying possible PMDD and subthreshold cases and controls. When the measurements referred to depressive symptoms and vulnerability, the comparisons were made between the three menstruation groups and the group of women with MDD. Inferential statistics: Snedecor's *F*, with normality and equality of variances, or if not, the Kruskal-Wallis H was applied. Student's *t* was used as a post hoc test, depending on whether there was equality of variances or not. Later, the evaluation of the participants by means of an interview confirmed or not the menstruation group they were in (second evaluation). For repeated measures between participant cycles, Friedman's chi-square was applied. Here only the measures of depressive symptoms and vulnerability were included. All the tests were done with a 95% confidence interval and $p < .05$.

Results

Descriptive statistics: Comparison of samples

The participant groups did not differentiate in age, $F_{(3, 101)} = 1.358$, $p = .260$, or social class, $F_{(3, 101)} = 0.226$, $p = .878$, but did by profession, $\chi^2_{(3, 105)} = 29.286$, $p = .004$.

1st Evaluation (retrospective)

In the PMDD group, 44 participants (72.7%) said interference was moderate in some area of activity (criteria D indicators), at work (59.1%), performance (52.3%), extra effort for recovery (70.5%), relationships with others (59.1%), tendency to avoid others (45.5%) and conflicts or disputes derived from these changes (54.5%). Eight women (18.2%) were job consequences due to premenstrual symptoms, or a maximum of 2.5 days (sick leave 2.3%). Due to menstrual symptoms, 23 women (52.3%) missed work for 0.5 to 2 days and 2.3% of the total took sick leave. They estimated that they needed about five days to recover their performance (*M*= 4.93, *SD* 14.62). Moreover, 31.8% of the women took medication during the premenstrual phase (analgesics) and 88.63% during the menstrual period; 11.4% of the women had been to a Social Security doctor (another 4.5% twice for this reason), and 15.9% had been to a private doctor (2.27% twice).

In the subsyndromal group (28 participants), moderate symptoms (criteria B and C) related to anxiety (67.9%), mood (60.7%), affective lability (50%) and irritability (60.7%) were notable. The consequences of premenstrual symptoms (criterion D) were mild (75%), there is a lower percentage of absenteeism, more menstrual than premenstrual symptoms (14.3%), and they estimated that they needed almost five days to recover their performance (*M*= 4.67, *SD* 18.51). There was no sick leave due to premenstrual symptoms except in one case and one day absent. In this group, 21.4% took medication during the premenstrual period, 85.71% during the menstrual period; 3.6% of the women had gone to a Social Security doctor (another 3.6% or four times a year), and 10.7% went to a private doctor.

In the control group (13 women), most of the symptoms were absent or mild. On the highest levels were physical symptoms (38.46% reported moderate to severe physical discomfort). Mild or no decline (46.2% for each level and for the overall evaluation of interference). Women's jobs were affected by menstrual symptoms, except in one case, but there were no absences for illness. Furthermore, the time these women needed to recover their performance was less than one day (*M*= 0.30, *SD* 0.63). 15.4% of these women took medication (analgesics) during their premenstrual period, while 46.2% did so during their menstrual period, 7.7% of the women went to a Social Security doctor and none went to a private doctor.

1st evaluation (inferential statistics)

Significant differences in premenstrual symptoms were found for criteria A, B and C (Table 1) in most of the areas, mainly due to the control group (Kruskal-Wallis nonparametric comparison). The group with the highest score was PMDD,

except for irritability. The subsyndrome and control groups did not differ statistically.

Table 1
One-way ANOVA (Kruskal-Wallis) of the groups. Intensity of indicators (criterion A, B, and C)

Clinical indicators	Total (*N*= 85) *M* (*SD*)	*K-W H*	PMDD (*n*= 44) *M* (*SD*)	Subsyndromal (*n*= 28) *M* (*SD*)	Control (*n*= 13) *M* (*SD*)
1B. Labialito	6.51 (2.93)	30.618**	7.66 (1.85)	7.04 (2.28)	1.46 (1.71)
2B. Irritability	6.56 (10.58)	18.811**	6.55 (2.52)	8.79 (17.87)	1.85 (2.47)
3B. Mood	5.46 (2.94)	28.125**	6.66 (2.10)	5.64 (2.55)	1.00 (1.78)
4B. Anxiety	5.16 (2.94)	26.149**	6.27 (2.39)	5.30 (2.60)	1.08 (1.49)
1C. Interest	2.69 (2.97)	22.712**	**4.07 (2.92)**	1.71 (2.56)	0.15 (.55)
2C. Concentration	2.44 (3.13)	17.956**	**3.84 (3.31)**	1.18 (2.42)	0.38 (.87)
3C. Energy	4.41 (3.33)	13.809**	5.43 (3.03)	4.29 (3.20)	1.23 (2.61)
4C. Appetite	3.87 (3.23)	9.170*	4.45 (3.19)	4.11 (3.31)	1.38 (1.93)
5C. Sleep	1.85 (3.13)	8.477*	**2.80 (3.58)**	1.14 (2.57)	0.15 (.55)
6C. Out of control	5.24 (2.92)	19.667**	**6.48 (1.97)**	4.71 (3.24)	2.15 (2.37)
7C.1 Increased breast size	5.68 (3.20)	11.236**	6.82 (2.73)	4.25 (3.56)	4.92 (2.46)
7C.2 Discomfort or pain (joints, muscles)	3.20 (3.67)	6.695*	**4.16 (3.79)**	2.21 (3.28)	2.08 (3.40)
7C.3 Digestive problems (swelling/diarrhea/constipation)	4.09 (3.51)	6.454*	4.80 (3.65)	3.96 (3.19)	2.00 (2.97)
7C.4 Headache	2.78 (3.18)	7.738*	3.57 (3.17)	2.39 (3.34)	0.92 (1.84)

Notes: K-WH= Kruskal-Wallis *H* test. Significant categories found with post hoc analysis (*t* test) are in bold. *p< .05; **p< .01.

Significant differences in criterion D (Table 2) were found between the three groups in most of the points considered. The post hoc test suggested differences in PMDD-Subsyndrome in terms of interference in everyday life, $t_{(70)}$= -2.85, p= .006, job consequences, $t_{(70)}$= -8.24, p= .0001, and days sick leave due to menstrual symptoms, $t_{(70)}$= -3.89, p= .001. The most general interference was observed in the PMDD group, mainly menstrual, not premenstrual.

The decrease in performance was significant during the premenstrual period, $t_{(70)=}$ -5.60, p= .0001, in the PMDD group, and in the menstrual period, $t_{(70)}$= -5.15, p= .0001, in the subsyndrome group. In addition, the PMDD group had worse recovery of performance, $t_{(70)}$= -4.47, p= .001, interference in relating with others, $t_{(70)}$= -4.50, p= .001, and tendency to avoid social situations, $t_{(70)}$= 4.60, p= .001.

When the number of criteria B and C indicators with intensity equal to or greater than 5 (moderate or higher) were considered, and the somatic indicators were transformed into a single value (average), the Kruskal-Wallis test showed significant differences, $\chi^2_{(2, 85)}$= 39.009, p< .05: The PMDD group had up to seven symptoms with at least moderate intensity (*M*= 7.22, *SD* 2.30) compared to the subsyndrome (*M*=5.42, *SD* 1.85) and control (*M*=0.61, *SD* 1.12) groups. However,

there were no statistically significant differences between PMDD and subsyndrome, $\chi^2_{(1, 72)}$= 12.249, *p*> .05.

Table 2
One-way ANOVA (Kruskal-Wallis) of the groups. Intensity of indicators (criterion D)

Indicators	Total (*N*= 85) *M* (*SD*)	*K-W H*	PMDD (*n*= 44) *M* (*SD*)	Subsyndromal (*n*= 28) *M* (*SD*)	Control (*n*= 13) *M* (*SD*)
Degree of interference in daily life	5.34 (10.63)	52.829**	**6.09 (14.04)**	2.11 (1.72)	0.62 (1.79)
Degree of interference in work	3.94 (2.94)	49.384**	**8.44 (1.98)**	2.32 (2.00)	1.31 (0.96)
Number of days absent because of menstrual symptoms	0.37 (.56)	15.824**	**0.60 (0.64)**	0.14 (.35)	0.07 (0.27)
Decrease in performance from premenstrual symptoms	3.06 (2.88)	31.745**	**4.70 (2.76)**	1.64 (1.87)	0.54 (1.19)
Decrease in performance from menstrual symptoms	4.38 (3.15)	34.582**	2.93 (2.19)	**6.27 (2.95)**	1.08 (1.65)
Number of days to recover adequate performance	4.14 (14.91)	30.340**	4.93 (14.62)	4.67 (18.51)	0.30 (0.63)
Effort required to carry out tasks	4.46 (2.88)	33.809**	**6.11 (1.90)**	3.46 (2.74)	1.00 (1.68)
Interference in relationships with others	4.87 (2.88)	39.562**	**6.59 (1.78)**	4.07 (2.59)	0.77 (1.09)
Avoidance of social situations	2.87 (2.94)	28.217**	**4.41 (2.93)**	1.68 (2.09)	0.23 (0.59)
Confrontation with others	3.69 (2.76)	26.162**	4.70 (2.46)	3.64 (2.55)	0.38 (1.12)

Notes: K-W H= Kruskal-Wallis *H* test. Significant categories found with post hoc analysis (*t* test) are in bold. *p< .05; **p< .01.

Analysis of mean intensity of all the B and C criteria instead of the number of symptoms showed a normal distribution (*KS*, *p*> .05). Analysis of variance suggested significant differences, $F_{(2, 82)}$= 37.285, *p*= .0001, especially in the PMDD group (*M*= 5.35, *SD* 1.22) versus subsyndromal (*M*= 4.33, *SD* 2.05) and control (*M*=1.24, *SD* 0.84). Post hoc analysis suggested significant differences between the PMDD and subsyndromal groups, $t_{(55)}$= -2.66, *p*= .010.

Taking the number of interference indicators with intensity equal to or greater than 5 for criterion D (*KS*, *p*< .05), there were significant between-group differences *KW*, $\chi^2_{(2, 85)}$= 51.86, *p*< .05, which were maintained for PMDD-subsyndromal, *KW*, $\chi^2_{(1, 72)}$= 34.77, *p*< .05. In the PMDD group, a mean of almost six interference indicators with intensity less than moderate were observed (*M*= 5.86, *SD* 1.85) compared to the subsyndromal (*M*= 2.03, *SD* 2.02) and control (*M*= .23, *SD* 0.59) groups.

Taking the overall intensity of interference, PMDD was significant, $F_{(2, 82)}$= 54.456, *p*= .0001, and the post hoc PMDD-subsyndrome differences were favorable for PMDD, $t_{(72)}$= -7.00, *p*= .0001. The mean intensity over interference was almost six points for the PMDD group (*M*= 5.91, *SD* 2.08) versus almost three in the subsyndromal (*M*= 2.73, *SD* 1.51) and control (*M*= .74, *SD* .97) groups.

1st evaluation (inferential statistics)

Comparisons between the four groups showed statistically significant differences in the overall measures because of the MDD group (Tables 3 and 4). There were no differences between groups related to menstruation in BAI, BDI, PSWQ and DAS and its factors ($p > .05$).

Table 3
One-way ANOVA of the groups - physical anxiety, depression and cognitive anxiety

Variables (instruments)	*M* (*SD*)	*F*	Levene *F*
Physical anxiety (Beck Anxiety Inventory)			
Premenstrual	12.45 (7.63)	13.551**	--
Subsyndromal	10.25 (6.66)		
Control	4.23 (4.76)	--	2.285
Depression	22.60 (7.44)		
Depression (Beck Depression Inventory)			
Premenstrual	8.86 (5.58)	36.112**	--
Subsyndromal	6.43 (5.09)		
Control	2.54 (1.13)	--	5.909**
Depression	24.05 (6.26)		
Cognitive anxiety (Penn State Worry Questionnaire)			
Premenstrual	54.52 (11.60)	4.622**	--
Subsyndromal	53.07 (9.56)		
Control	50.77 (11.48)	--	2.653
Depression	62.30 (9.69)		

Note: N= 105; *$p < .05$; **$p < .01$.

No significant differences in the DAS emotional Dependency factor were found in the group of depressed women compared to the other three groups ($p > .05$). In the DAS Autonomy factor, depressed women had significantly more dysfunctional attitudes than controls ($t_{(33)} = -2.37$, $p < .05$), but did not differ from the PMDD group or subsyndrome ($p > .05$). Neither were there any differences between subsyndrome and the control group ($t_{(41)} = -1.81$, $p > .05$), but there were between the subsyndrome and PMDD groups ($t_{(72)} = -2.31$, $p < .05$).

2nd Evaluation (clinical evaluation)

The clinical evaluation showed that five women in the PMDD group met diagnostic criteria (5.88% of the sample, *N*= 85), versus 51.76% of the participants who self-reported it. In the subsyndromal group, seven participants met characteristics very close to PMDD (except for criterion A) (8.3% of the sample, *N*= 85) versus 32.94% who self-reported it.

Table 4
One-way analysis of variance of the groups on the cognitive vulnerability measure and factors (Dependency, Achievement and Autonomy)

DAS and its factors	*n*	*M* (*SD*)	*F*	Levene *F*
Total				
Premenstrual	44	113.52 (21.71)	8.421**	--
Subsyndromal	28	110.04 (25.56)		
Control	13	94.08 (17.45)	--	2.109
Depressive	20	155.42(34.97)		
Achievement				
Premenstrual	44	31.64 (9.50)	24.371**	--
Subsyndromal	28	29.14 (9.06)		
Control	13	24.85 (6.63)	--	1.365
Depression	20	60.89 (11.26)		
Dependency				
Premenstrual	44	31.07 (7.65)	3.512	
Subsyndromal	28	30.50 (8.012)		
Control	13	25.46 (5.52)		2.018
Depressive	20	32.89 (7.98)		
Autonomy				
Premenstrual	44	17.27 (4.35)	3.155*	
Subsyndromal	28	18.32 (4.67)		
Control	13	14.77 (4.38)		1.108
Depressive	20	20.05 (5.97)		

Notes: DAS= Dysfunctional Attitudes Scale. *p< .05; **p< .01.

2nd Evaluation (prospective evaluation)

Twelve participants with PMDD or subsyndromal characteristics by BDI and DAS criteria were followed up during three consecutive menstrual cycles for the follicular or premenstrual phase. The results (Table 5) did not show significant differences in depressive symptoms (BDI) between follicular and premenstrual measurements in any of the three cycles included.

The vulnerability measure (DAS) did not show statistically significant differences for the premenstrual period. However, almost all the means are more pronounced in the premenstrual phase. Only the Dependency factor (in one cycle) and Autonomy factor (in the same cycle) were significant.

Table 5
Friedman comparison of the extent of depression and cognitive vulnerability and factors during the follicular and premenstrual phases (three cycles)

Variables (instruments)	Follicular phase *M* (*SD*)	Premenstrual phase *M* (*SD*)	χ^2
Depression (BDI)			
Cycle 1	2.90 (3.41)	2.90 (1.82)	0.667
Cycle 2	2.60 (3.80)	2.60 (4.83)	0.333
Cycle 3	4.57 (5.88)	3.29 (2.49)	0.200
Cognitive vulnerability (DAS)			
Total			
Cycle 1	111.70 (28.63)	114.70 (26.25)	0.400
Cycle 2	110.88 (28.66)	115.77 (29.55)	0.111
Cycle 3	122.14 (27.41)	118.42 (25.40)	0.000
Dependency			
Cycle 1	29.70 (9.78)	32.00 (9.22)	4.50*
Cycle 2	29.80 (7.88)	29.70 (7.40)	0.143
Cycle 3	31.12 (6.70)	30.87 (6.28)	0.000
Achievement			
Cycle 1	28.70 (13.70)	30.30 (9.09)	0.111
Cycle 2	28.10 (11.27)	30.40 (9.96)	0.500
Cycle 3	30.50 (8.33)	31.00 (7.23)	0.000
Autonomy			
Cycle 1	15.30 (4.90)	17.50 (4.11)	4.50*
Cycle 2	17.80 (5.75)	18.00 (4.69)	0.111
Cycle 3	16.75 (4.94)	17.12 (4.99)	0.333

Notes: BDI= Beck Anxiety Inventory; DAS= Dysfunctional Attitudes Scale. *N*= 12; * $p< .05$; ** $p< .01$.

Discussion

This study attempted to estimate the presence of premenstrual dysphoric disorder (PMDD) in a group of women by comparing their self-diagnosis with a clinical evaluation. The symptoms of PMDD and subthreshold manifestations and their intensity were analyzed and compared, determining their social-employment and relational consequences. Between-group differences were also analyzed for the PMDD group and a group of women with Major Depressive Disorder (MDD), identifying any possible difference in cognitive vulnerability to depression, as well as predicting vulnerability to depression in the premenstrual phase.

According to the self-evaluations, 51.76% of the women referred to indicators compatible with PMDD. The clinical evaluation discarded most of the cases as not meeting DSM-5 (APA, 2022) criteria, confirming only 5.88% as PMDD, in agreement with the expected incidence of about 3-8% (Beddig & Kuehner, 2017; Dennerstein et al., 2009; Ryu & Kim, 2015). Previous studies have found that premenstrual symptoms affect 90% of women (Braverman, 2007), that from 30 to 40% of these women end up experiencing premenstrual syndrome

(PMS) (Ryu & Kim, 2015), and 1.3-5.8% are confirmed cases (APA, 2022). The inconsistency in prevalence rates of PMS and PMDD is known (Albsoul-Younes et al., 2017; Izadi & Amiri, 2019; Prasad et al., 2021), and could be reflecting overestimation of premenstrual symptoms by the participants, confirming the first hypothesis. The figure even surpasses 14% when subsyndromal cases are also analyzed. It is possible that inclusion in this category in the diagnostic manuals has increased awareness of PMDD, and therefore, the probability that women identify PMDD, and ask their primary attention doctor about their self-diagnosis. Research has shown that women are more likely to pathologize alterations of mood and negative premenstrual experiences, biasing their memory and beliefs about themselves (Marván et al., 2001), especially when considering PMDD a medical disorder (Browne, 2014; Nash & Chrisler, 1997). Although some studies in the literature have questioned the role of expectations in overestimating the severity of PMDD symptoms (Gallant et al., 1992), it cannot be discarded that consideration as a disorder or medical pathology, along with stronger self-awareness of the manifestations experienced may have that role.

On a descriptive level, the group self-diagnosed as PMDD emphasized the intensity of symptoms of anxiety, impulsivity, mood, irritability and changes in appetite. The control group showed fewer symptoms in general and less severe, except for physical symptoms, which coincided with what was expected (Pearlstein et al., 2005; Yan et al., 2021).

Differences were found between the PMDD and subsyndromal groups in mean intensity of symptoms, but not with symptomatic specificity, so Hypothesis 2 was partially confirmed. Cognitive and motivational indicators showing more loss of interest and concentration are salient in the PMDD group. Physiological research has proposed a characteristic PMDD pattern with increased amygdala functioning and diminished frontal cortex functioning against emotional stimuli, affecting cognitive processing and emotion and behavioral regulation (Dubol et al., 2020).

In this study, women with PMDD showed more general interference with their work, in relationships with others and a tendency to avoid social situations. This partially confirms the third hypothesis, as women in the subsyndromal group also experienced interference with their social, employment and relational activities. Borenstein et al. (2007) found that women with moderate-to-severe premenstrual symptoms had significantly more sick leave, loss of productivity and a strong probability of seeking medical attention. Another study by Hardy and Hardie (2017) explored the experience of 15 women with PMDD in the workplace and identified their most common symptoms as difficulty in concentrating, doubt, paranoia, fatigue, crying, stronger sensitivity to their surroundings and to people, outbursts, and finding social interaction particularly hard during this phase of the premenstrual period.

Therefore, although most of those self-reported as PMDD were not identified as such, it is obvious that there was distress and a strong degree of interference in both the PMDD and subsyndromal groups. In the context of reproductive health,

women's access to medical attention is considered difficult (Osborn, Wittkowski et al., 2020), perhaps due to the tendency to overestimation observed, causing a decrease in necessary medical attention (Hoffmann & Tarzian, 2001), or propensity to erroneous psychological diagnoses (Dusenbery, 2018). This suggests the need for more research and psychoeducation so premenstrual symptoms can be identified accurately and coped with, so they cause less interference in everyday life and lower social-employment cost.

One result which requires further analysis is the strong interference of the menstrual phase instead of the premenstrual phase in performance, absenteeism or sick leave. A recent study by Li et al. (2021) suggests the importance of mental (not physical) fatigue during the mid-luteal phase, causing risk of emotional dysregulation and less control of negative, repetitive, and inflexible cognitions. Since subjective fatigue is a transdiagnostic characteristic (e.g., depression and anxiety) (Fuentes-Márquez et al., 2015), these findings must be replicated. It is possible that fatigue interacts with other variables, expanding to the menstrual phase, and interfering in social-employment activity.

In agreement with another study, it is probable that the economic repercussion and rigidity of job organization is related with these results, especially, in contexts with less job flexibility or employment by others (Chawla, et al., 2002). This study had a significant representation of university students and self-employed workers, so days absent, and absenteeism are more realistic. Under such occupational conditions, the symptoms are related more to the needs of these women, whether they remain at work or are absent. Therefore, it is possible that more awareness and support mechanisms are needed for employees with this condition.

A different clinical profile was observed between the menstruation groups and women with MDD with regard to anxiety, cognition and mood, which confirmed the fourth hypothesis. The consideration that PMDD is simply an MDD included in the menstrual cycle has also been largely refuted by the differences in neuroendocrine findings and in response times to antidepressants (Endicott et al., 1999).

Concerning cognitive vulnerability (DAS), the fifth hypothesis is partially accepted, as when the PMDD and MDD groups were compared, the latter's averages were striking. The Achievement Factor separates the depressed group from the other three. The most interesting finding comes from the Autonomy factor, since there were no differences between the two groups related to menstruation and the women with MDD. The post hoc test on the PMDD and MDD groups, suggesting vulnerability related to a feeling of being defenseless and lacking control could be common, and different from the Achievement factor which would be more specific to depression.

Other studies have shown that women with PMDD use deficient coping strategies, such as more attention focused on themselves in response to stress, as well as rumination (Craner et al., 2014, 2015), demonstrating that deficits in

emotion regulation strategies are related to premenstrual symptoms in women with PMDD (Dawson et al., 2018). It has also been demonstrated that rumination moderates the effects of the menstrual cycle on mood in a nonclinical sample, favoring irritability toward the end of the cycle (Welz et al., 2016). At present, fluctuations in ovarian steroids, in particular progesterone are considered to be the physiopathological basis of PMDD (Comasco et al., 2021), so there could be a certain sensitivity to depressive disorders. However, it remains to be determined whether this hormone-cognitive process interaction actually sensitizes to depressive disorders and how to manage these problems.

Prospective evaluation did not reveal any specific vulnerability to PMDD, nor to its subsyndromal form with respect to (pre)menstrual phase, therefore discarding the sixth hypothesis. Changes in premenstrual measures (two specific results related to the Autonomy and Dependency factor) were observed, although insufficient because they were only present in one cycle.

This study had some limitations which should be considered. One of the main drawbacks is the sample size, its origin (mostly university students) and its age (young women), as it is true that at these early ages when PMDD begins to be observed, a wider age range is necessary, and particularly, of a larger number of participants in each of the groups. A larger number of participants, including more MDD patients and others with other depressive disorders would clarify the characteristics of cognitive vulnerability. It would also be of interest to go deeper into the role of body self-concept, beliefs about health, and determine as accurately as possible cognitive vulnerability to depression, coping with everyday problems and quality of life. Another limitation is the design itself, as the PMDD diagnosis should be made prospectively and the measures diversified to clarify the difference between PMDD and MDD. Thus, in a longitudinal study, it could be determined whether premenstrual manifestations sensitize to or mediate MDD, and also verify the role of fatigue, rumination and how to strengthen more effective coping.

These results imply the impact of considering PMDD a medical disease, the natural tendency to self-observation and reaction to emotional symptoms linked to hormonal changes as points to be considered from a clinical viewpoint. Perhaps, normalization, more than pathologization could contribute to better care of women whose premenstrual mood instability is clearer, and keep in mind the effects on their functioning.

In conclusion, overestimation of premenstrual symptoms has been observed in women related to PMDD. But consistency in description of the symptomatology in the two phases of the study was also noted, which suggests that many of the participants must cope with a series of physical and emotional experiences, probably without knowing how to. Separation of PMDD and MDD was ratified, suggesting possible cognitive vulnerability to common depression (specifically, in the Autonomy factor), especially in the premenstrual phase, although not verified in the three consecutive cycles analyzed. We suggest that women with PMDD may

consider themselves to be limited insofar as an accurate diagnosis, favoring the stigma associated with physical and mental health conditions. Therefore, it is fundamental for healthcare professionals to be able to distinguish precisely PMDD and other associated problems to ensure that women with this condition receive adequate intervention, and are able to cope better with subthreshold expressions or problems that may arise.

References

Albsoul-Younes, A., Alefishat, E., Farha, R. A., Tashman, L., Hijjih, E., & AlKhatib, R. (2017). Premenstrual syndrome and premenstrual dysphoric disorders among Jordanian women. *Perspectives in Psychiatric Care, 54*(3), 348-353. doi: 10.1111/ppc.12252

American Psychiatric Association, APA (2013). *Diagnostic and statistical manual of mental disorders* (5th Ed.) (DSM-5). American Psychiatric Association.

American Psychiatric Association. (2022). *Diagnostic and statistical manual of mental disorders* (5th Ed. Tex. Rev.) (DSM-5-TR). American Psychiatric Association.

Beck, A. T. (1967). *Depression: Clinical, experimental, and theoretical aspects.* Harper and Row.

Beck, A. T., Epstein, N., Brown, G., & Steer, R. A. (1988). An inventory for measuring clinical anxiety: Psychometric properties. *Journal of Consulting and Clinical Psychology, 56*, 893-897. doi: 10.1037/0022-006X.56.6.893

Beck, A. T., Rush, A. J., Shaw, B. F., & Emery, G. (1979). *Cognitive therapy of depression*. Guilford.

Beddig, T., & Kuehner, C. (2017). Aktuelle aspekte zur prämenstruellen dysphorischen störung – Ein überblick [Current aspects of premenstrual dysphoric disorder – A review]. *Psychotherapie, Psychosomatik, Medizinische Psychologie, 67*(12), 504-513. doi: 10.1055/s-0043-113816

Beddig, T., Reinhard, I., & Kuehner, C. (2019). Stress, mood, and cortisol during daily life in women with premenstrual dysphoric disorder (PMDD). *Psychoneuroendocrinology, 109*, 104372. doi: 10.1016/j.psyneuen.2019.104372

Borenstein, J. E., Dean, B. B., Leifke, E., Korner, P., & Yonkers, K. A. (2007). Differences in symptom scores and health outcomes in premenstrual syndrome. *Journal of Women's Health, 16*, 1139-1144. doi: 10.1089/jwh.2006.0230

Bosman, R. C., Jung, S. E., Miloserdov, K., Schoevers, R. A., & aan het Rot, M. (2016). Daily symptom ratings for studying premenstrual dysphoric disorder: A review. *Journal of Affective Disorders, 189*, 43-53. doi: 10.1016/j.jad.2015.08.063

Braverman, P. K. (2007). Premenstrual syndrome and premenstrual dysphoric disorder. *Journal of Pediatric and Adolescent Gynecology, 20*(1), 3-12. doi: 10.1016/j.jpag.2006.10.007

Browne, T. K. (2014). Is premenstrual dysphoric disorder really a disorder? *Journal of Bioethical Inquiry, 12*(2), 313-330. doi: 10.1007/s11673-014-9567-7

Cerqueira, R. O., Frey, B. N., Leclerc, E., & Brietzke, E. (2017). Vitex agnus castus for premenstrual syndrome and premenstrual dysphoric disorder: A systematic review. *Archives of Women's Mental Health, 20*(6), 713-719. doi: 10.1007/s00737-017-0791-0

Chawla, A., Swindle, R., Long, S., Kennedy, S., & Sternfeld, B. (2002). Premenstrual dysphoric disorder: Is there an economic burden of illness? *Medical Care, 40*, 1101-1112. doi: 10.1097/01.mlr.0000032191.26152.90

Cohen, L. S., Soares, C. N., Otto, M. W., Sweeney, B. H., Liberman, R. F., & Harlow, B. L. (2002). Prevalence and predictors of premenstrual dysphoric disorder (PMDD) in older premenopausal women. *Journal of Affective Disorders, 70*(2), 125-132. doi: 10.1016/s0165-0327(01)00458-x

Comasco, E., Kopp Kallner, H., Bixo, M., Hirschberg, A. L., Nyback, S., de Grauw, H., Epperson, C. N., & Sundström-Poromaa, I. (2021). Ulipristal acetate for treatment of premenstrual dysphoric disorder: A proof-of-concept randomized controlled trial. *American Journal of Psychiatry, 178*(3), 256-265. doi: 10.1176/appi.ajp.2020.20030286

Craner, J. R., Sigmon, S. T., Martinson, A. A., & McGillicuddy, M. L. (2014). Premenstrual disorders and rumination. *Journal of Clinical Psychology, 70*(1), 32-47. doi: 10.1002/jclp.22007

Craner, J. R., Sigmon, S. T., & Martinson, A. A. (2015). Self-focused attention in response to laboratory stressors among women with premenstrual disorders. *Archives of Women's Mental Health, 18*(4), 595-606. doi: 10.1007/s00737-015-0505-4

Cunningham, J., Yonkers, K. A., O'Brien, S., & Eriksson, E. (2009). Update on research and treatment of premenstrual dysphoric disorder. *Harvard Review of Psychiatry, 17*(2), 120-137. doi: 10.1080/10673220902891836

Dawson, D. N., Eisenlohr-Moul, T. A., Paulson, J. L., Peters, J. R., Rubinow, D. R., & Girdler, S. S. (2018). Emotion-related impulsivity and rumination predict the perimenstrual severity and trajectory of symptoms in women with a menstrually related mood disorder. *Journal of Clinical Psychology, 74*(4), 579-593. doi: 10.1002/jclp.22522

Dennerstein, L., Lehert, P., Bäckström, T. C., & Heinemann, K. (2009). Premenstrual symptoms - severity, duration and typology: An international cross-sectional study. *Menopause International, 15(*3), 120-126. doi: 10.1258/mi.2009.009030

Dubol, M., Epperson, C. N., Lanzenberger, R., Sundström-Poromaa, I., & Comasco, E. (2020). Neuroimaging premenstrual dysphoric disorder: A systematic and critical review. *Frontiers in Neuroendocrinology, 57*, 100838. doi: 10.1016/j.yfrne.2020.100838

Dusenbery, M. (2018). *Doing harm: The Truth About How Bad Medicine and Lazy Science Leave Women Dismissed, Misdiagnosed, and Sick*. HarperOne.

Endicott, J., Amsterdam, J., Eriksson, E., Frank, E., Freeman, E., Hirschfeld, R., Ling, F., Parry, B., Pearlstein, T., Rosenbaum, J., Rubinow, D., Schmidt, P., Severino, S., Steiner, M., Stewart, D. E., & Thys-jacobs, S. (1999). Is premenstrual dysphoric disorder a distinct clinical entity? *Journal of Women's Health y Gender-Based Medicine, 8*(5), 663-679. doi: 10.1089/jwh.1.1999.8.663

Eysenck, H.J., & Eysenck, S.B.G. (1990). *Cuestionario de personalidad E.P.I* [Eysenck Personality Inventory]. TEA (6th Ed).

Fuentes-Márquez, S., Senín-Calderón, C., Rodríguez-Testal, J. F., & Carrasco-Ortiz, M. A. (2015). Perceived experience of fatigue in clinical and general population: Descriptors and associated reactivities. *The Spanish Journal of Psychology, 18*, 1-8. doi: 10.1017/sjp.2015.11.

Gallant, S. J., Popiel, D. A., Hoffman, D. M., Chakraborty, P. K., & Hamilton, J. A. (1992). Using daily ratings to confirm premenstrual syndrome/late luteal phase dysphoric disorder. Part I. Effects of demand characteristics and expectations. *Psychosomatic Medicine, 54*(2), 149-166. doi: 10.1097/00006842-199203000-00003

Green, L. J., O'Brien, P. M. S., Panay, N., Craig, M., & on behalf of the Royal College of Obstetricians and Gynaecologists. (2017). *Management of premenstrual syndrome. BJOG*, *124,* e73-e105. doi: 10.1111/1471-0528.14260

Hardy, C., & Hardie, J. (2017). Exploring premenstrual dysphoric disorder (PMDD) in the work context: A qualitative study. *Journal of Psychosomatic Obstetrics y Gynecology, 38*(4), 292-300. doi: 10.1080/0167482x.2017.1286473

Hartlage, S. A., Breaux, C. A., & Yonkers, K. A. (2013). Addressing concerns about the inclusion of premenstrual dysphoric disorder in DSM-5. *The Journal of Clinical Psychiatry, 75*(01), 70-76. doi: 10.4088/jcp.13cs08368

Henz, A., Ferreira, C. F., Oderich, C. L., Gallon, C. W., Castro, J. R. S., Conzatti, M., Fleck, M. P. A., & Wender, M. C. O. (2018). Premenstrual syndrome diagnosis: A comparative study between the Daily Record of Severity of Problems (DRSP) and the Premenstrual Symptoms Screening Tool (PSST). *Revista Brasileira de Ginecologia e Obstetricia, 40*(1), 20-25. doi: 10.1055/s-0037-1608672

Hoffmann, D. E., & Tarzian, A. J. (2001). The girl who cried pain: A bias against women in the treatment of pain. *Journal of Law, Medicine y Ethics, 29*(1), 13-27. doi: 10.1111/j.1748-720x.2001.tb00037.x

Ingram, R. E., Atchley, R. A., & Segal, Z. V. (2011). *Vulnerability to depression: From cognitive neuroscience to prevention and treatment.* Guilford.

Izadi, M., & Amiri, S. (2019). Personality characteristics in female students with premenstrual dysphoric disorder and premenstrual syndrome. *Advances in Nursing and Midwifery, 28*(3), 40-45.

Kleinstäuber, M., Schmelzer, K., Ditzen, B., Andersson, G., Hiller, W., & Weise, C. (2016). Psychosocial profile of women with premenstrual syndrome and healthy controls: A comparative study. *International Journal of Behavioral Medicine, 23*(6), 752-763. doi: 10.1007/s12529-016-9564-9

Li, H. J., Goff, A., Rudzinskas, S. A., Jung, Y., Dubey, N., Hoffman, J., Hipolito, D., Mazzu, M., Rubinow, D. R., Schmidt, P. J., & Goldman, D. (2021). Altered estradiol-dependent cellular Ca2+ homeostasis and endoplasmic reticulum stress response in Premenstrual Dysphoric Disorder. *Molecular Psychiatry.* doi: 10.1038/s41380-021-01144-8

Magán, I., Sanz, J., & García-Vega, M. P. (2008). Psychometric properties of a Spanish version of the Beck Anxiety Inventory (BAI) in general population. *The Spanish Journal of Psychology, 11*, 626-640. doi: 10.1017/S1138741600004637

Marván, M. L., & Cortés-Iniestra, S. (2001). Women's beliefs about the prevalence of premenstrual syndrome and biases in recall of premenstrual changes. *Health Psychology, 20,* 276-280. doi: 10.1037//0278-6133.20.4.276

Meyer, T. J., Miller, M. L., Metger, R. L., & Borkovec, T. D. (1990). Development and validation of the Penn State Worry Questionnaire. *Behaviour Research and Therapy, 28,* 487-495.

Nash, H. C., & Chrisler, J. C. (1997). Is a little (psychiatric) knowledge a dangerous thing?: The impact of premenstrual dysphoric disorder on perceptions of premenstrual women. *Psychology of Women Quarterly, 21*(2), 315-322. doi: 10.1111/j.1471-6402.1997.tb00115.x

Nogueira Pires, M. L., & Calil, H. M. (2000). Clinical utility of the premenstrual assessment form as an instrument auxiliary to the diagnosis of premenstrual dysphoric disorder. *Psychiatry Research, 94*(3), 211-219. doi: 10.1016/s0165-1781(00)00151-7

Osborn, E., Brooks, J., O'Brien, P. M. S., & Wittkowski, A. (2020). Suicidality in women with Premenstrual Dysphoric Disorder: A systematic literature review. *Archives of Women's Mental Health, 24*(2), 173-184. doi: 10.1007/s00737-020-01054-8

Osborn, E., Wittkowski, A., Brooks, J., Briggs, P. E., & O'Brien, P. M. S. (2020). Women's experiences of receiving a diagnosis of premenstrual dysphoric disorder: A qualitative investigation. *BMC Women's Health, 20*(1). doi: 10.1186/s12905-020-01100-8

Pearlstein, T., Yonkers, K. A., Fayyad, R., & Gillespie, J. A. (2005). Pretreatment pattern of symptom expression in premenstrual dysphoric disorder. *Journal of Affective Disorders, 85*, 275-282. doi: 10.1016/j.jad.2004.10.004

Pilver, C. E., Libby, D. J., & Hoff, R. A. (2012). Premenstrual dysphoric disorder as a correlate of suicidal ideation, plans, and attempts among a nationally representative sample. *Social Psychiatry and Psychiatric Epidemiology, 48*(3), 437-446. doi: 10.1007/s00127-012-0548-z

Prasad, D., Wollenhaupt-Aguiar, B., Kidd, K. N., de Azevedo Cardoso, T., & Frey, B. N. (2021). Suicidal risk in women with premenstrual syndrome and premenstrual dysphoric disorder: A systematic review and meta-analysis. *Journal of Women's Health*. doi: 10.1089/jwh.2021.0185

Raffi, E., & Freeman, M. P. (2018). Diagnosis, etiology, and treatment of premenstrual dysphoric disorder. *DeckerMed Psychiatry*. doi: 10.2310/psych.13018

Reed, G. M., First, M. B., Kogan, C. S., Hyman, S. E., Gureje, O., Gaebel, W., Maj, M., Stein, D. J., Maercker, A., Tyrer, P., Claudino, A., Garralda, E., Salvador-Carulla, L., Ray, R., Saunders, J. B., Dua, T., Poznyak, V., Medina-Mora, M. E., Pike, K. M., . . . Saxena, S. (2019). Innovations and changes in the ICD-11 classification of mental, behavioural and neurodevelopmental disorders. *World Psychiatry, 18*(1), 3-19. doi: 10.1002/wps.20611

Reid, R. L., & Soares, C. N. (2018). Premenstrual dysphoric disorder: Contemporary diagnosis and management. *Journal of Obstetrics and Gynaecology Canada, 40*(2), 215-223. doi: 10.1016/j.jogc.2017.05.018

Rodríguez-Testal, J. F. (2021). *Registro diario para la disforia premenstrual* [Daily Record of Premenstrual Dysphoria] [Unpublished Manuscript]. Intellectual property registration RTA-02702-2021.

Ryu, A., & Kim, T. H. (2015). Premenstrual syndrome: A mini review. *Maturitas, 82*(4), 436-440. doi: 10.1016/j.maturitas.2015.08.010

Sandín, B., Chorot, P., Valiente, R. M., & Lostao, L. (2009). Validación española del cuestionario de preocupación PSWQ: Estructura factorial y propiedades psicométricas [Spanish validation of the PSWQ: Factor structure and psychometric properties]. *Revista de Psicopatología y Psicología Clínica, 14*, 107-122. doi: 10.5944/rppc.vol.14.num.2.2009.4070

Sanz, J., Gutiérrez, S., Gesteira, C., & García-Vera, M. P. (2014) Criterios y baremos para interpretar el "Inventario de depresión de Beck-II" (BDI-II) [Criteria and norms for interpreting the Beck Depression Inventory-II (BDI-II)]. *Behavioral Psychology/Psicología Conductual, 22*(1), 37-59.

Sigmon, S. T., Whitcomb-Smith, S. R., Rohan, K. J., & Kendrew, J. J. (2004). The role of anxiety level, coping styles, and cycle phase in menstrual distress. *Journal of Anxiety Disorders, 18*(2), 177-191. doi: 10.1016/s0887-6185(02)00243-8

Soares, C. N., & Zitek, B. (2008). Reproductive hormone sensitivity and risk for depression across the female life cycle: A continuum of vulnerability? *Journal of Psychiatry and Neuroscience, 33*(4), 331-343.

Studd, J. (2012). Severe premenstrual syndrome and bipolar disorder: A tragic confusion. *Menopause International, 18*(2), 82-86. doi: 10.1258/mi.2012.012018

Vázquez, C., & Sanz, J. (1997). Fiabilidad y valores normativos de la versión española del Inventario para la depresión de Beck de 1978 [Reliability and normative data of the Spanish version of 1978 Beck's Depression Inventory]. *Clínica y Salud, 8*, 403-422.

Weissman, A., & Beck, A.T. (1978). *Development and validation of the Dysfunctional Attitudes Scale* [Paper]. The meeting of the association for the Advacement of Behavior Therapy, Chicago, IL, United States.

Welz, A., Huffziger, S., Reinhard, I., Alpers, G. W., Ebner-Priemer, U., & Kuehner, C. (2016). Anxiety and rumination moderate menstrual cycle effects on mood in daily life. *Women y Health, 56*(5), 540-560. doi: 10.1080/03630242.2015.1101739

Yan, H., Ding, Y., & Guo, W. (2021). Suicidality in patients with premenstrual dysphoric disorder- A systematic review and meta-analysis. *Journal of Affective Disorders, 295*, 339-346. doi: 10.1016/j.jad.2021.08.082

RECEIVED: JUNE 24, 2022
ACCEPTED: DECEMBER 10, 2022