

# Innovations

## Impact of Loneliness on Premenstrual Dysphoric Disorder

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### Abstract:

**Background:** Premenstrual Dysphoric Disorder (PMDD) affects women of reproductive years by reducing functionality. Limited research exists on psychosocial factors like especially for undergraduates in developing countries like Nigeria. Given the crucial role of emotional and social experiences in shaping mental health, loneliness, a prevalent psychological distress among young adults, may contribute significantly to PMDD incidence. Therefore, this study's objective is to investigate the impact of loneliness on premenstrual dysphoric disorder among female undergraduates. **Methods:** The study utilised a cross-sectional survey design on the population of Lagos State University female undergraduates, using the convenience sampling method to identify female participants. It used a validated self-report questionnaire containing demographic information, the Premenstrual Symptoms Screening Tool (PSST) and the 8-item Loneliness Scale by the University of California, Los Angeles (ULS-8). The data was subjected to SPSS for statistical analysis to test the hypothesis using regression. The significance criterion for testing the hypothesis was set at  $p < 0.05$ . **Results:** The study consisted of 386 female participants with a mean of 20.56 and a standard deviation of 2.47. The findings reflected loneliness as a significant predictor of PMDD [ $R^2 = .016$ ,  $F(1, 385) = 6.337$ ,  $p < 0.05$ ] with coefficient  $B = .06$ . **Conclusion:** Loneliness was identified as a predictor of Premenstrual Dysphoric Disorder (PMDD). Reducing loneliness may lower PMDD incidence. Future studies should explore geographic and psychosocial variables like resilience. Programs targeting awareness of the relationship should be developed within universities along side support programs to prevent and mitigate symptoms.

**Keywords:** Premenstrual Dysphoric Disorder, Loneliness, Undergraduates, Female.

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### 1. Introduction

Premenstrual Dysphoric Disorder (PMDD) is a severe and debilitating condition strictly experienced only by females during their reproductive years. It is characterised by a distinct cluster of emotional and physical symptoms that occur

during the luteal phase of the menstrual cycle and remit with the onset of menstruation (American Psychological Association, 2022). Unlike the more common Premenstrual Syndrome (PMS), PMDD is marked by pronounced mood disturbances, including anxiety, irritability, and severe mood swings, which can significantly impair daily functioning and quality of life. Like every mental disorder it is marked by abnormalities in behaviour. (Etinosa, Gbadebo, Olawale, Oke, & Gayus, 2022).

Premenstrual Dysphoric Disorder (PMDD) impacts the performance and productivity of sufferers in a variety of ways, which the DSM-V-TR (2022) groups into A and B criteria (APA, 2022). Criteria A symptoms include marked irritability, increased emotional sensitivity (mood swings, or crying), anxiousness, self-depreciating thoughts, while criteria B symptoms include hypersomnia or insomnia, low interest, difficulty concentrating, low energy, appetite change, feeling of being overwhelmed and physical symptoms (tender breasts, muscle or joint pain, weight gain) (APA, 2022). At least five of these symptoms of reduced functionality, including a minimum of one from each group, must be present in an individual for a diagnosis of PMDD to be determined (APA, 2022). Current estimates suggest that PMDD affects approximately 3-8% of women of reproductive age, with symptoms that are severe enough to disrupt personal, social, and professional aspects of life (Haußmann, Goeckenjan, Haußmann, & Wimberger, 2024).

The impact of Premenstrual Dysphoric Disorder (PMDD) extends beyond individual health, as it has been shown to increase the risk of suicidal ideation in affected individuals, highlighting the urgent need for comprehensive research and intervention strategies (Irem Ekmekçi Ertek, Mehmet Ünler, Aysegul Yay Pençe, & Aycan Kayalar, 2023). Women with PMDD are also at risk of comorbidity as they may also experience other mental disorders or physical ailments (APA, 2022). PMDD has been observed to manifest alongside feelings of loneliness during the luteal phase (APA, 2022). Particularly during the luteal phase, the cyclical emotional toll of PMDD frequently fosters an atmosphere where feelings of loneliness are common. As people struggle with the psychological effects of PMDD symptoms, this time of increased emotional vulnerability can make loneliness worse. Loneliness and PMDD have a profoundly intertwined relationship that exacerbates emotional discomfort (APA, 2022).

Loneliness is a subjective feeling of isolation by an individual. Therefore, it can only be determined by the individual in question. Individuals tend to feel lonely when they fail to achieve their personal need for social interaction (Takeda et al., 2023). Loneliness can thus also be considered an inadequacy in creating and maintaining relationships. Loneliness is a concern as every individual naturally feels a varying need to interact with other human beings (Wang, Mann, Lloyd-Evans, Ma, & Johnson, 2018). Loneliness, defined as the subjective feeling of isolation and lack of meaningful social connections, has been increasingly recognised as a significant contributor to various mental health disorders.

Loneliness is a subjective feeling of isolation by an individual (Takeda et al., 2023). Therefore, human beings are all at risk of feeling loneliness due to human orientation as social animals that desire to bond with their social environment (Langenkamp, 2022). Although, certain populations are at higher risk of experiencing loneliness due to their inherent disposition (Rokach & Boulazreg, 2024).

Loneliness has been found to have associations with depression and depressive disorders such as Premenstrual Dysphoric Disorder (PMDD) (Culbreth, Barch, & Moran, 2021). Studies have indicated that loneliness in an individual tends to increase the potential for PMDD as it is a source of stress to individual females (Igbokwe et al., 2020; Jensen-Campbell et al., 2023). In addition, loneliness has been proven to be correlated to the occurrence of depressive symptoms amongst individuals (Giacco, 2022). The inadequacy of desired social interaction that occurs in loneliness can cause or worsen fluctuations in mood and depressive disorders, such as PMDD, in the individual among other potential consequences (Hawkey & Cacioppo, 2010).

Women suffering from PMDD often experience heightened emotional distress, which may be exacerbated by feelings of loneliness. This emotional turmoil can create a vicious cycle where loneliness intensifies PMDD symptoms, leading to further withdrawal from social interactions and increased feelings of isolation. The cyclical relationship between loneliness and PMDD can create a feedback loop: loneliness may worsen PMDD symptoms, which can lead to further withdrawal from social interactions and increased isolation.

Despite the established significance of loneliness in mental health, its specific role in PMDD remains underexplored. Current literature often prioritises biological explanations, neglecting the psychosocial dimensions that profoundly influence the disorder's manifestation. Particularly in cultural contexts like Nigeria, where discussions of women's mental health are often stigmatised, there is a pressing need for research that examines how loneliness interact to affect PMDD symptoms. This is because research on PMDD is on low levels due to its only recent inclusion in the DSM-V. This is particularly so within Nigeria. The limited research on PMDD, due to its recent inclusion in the DSM-V, further emphasizes the need for comprehensive studies in this area.

This study aimed to address the critical research gap by investigating the impact of loneliness on PMDD among female undergraduates at Lagos State University. The study aimed to offer insights capable of guiding focused treatments for women in Nigeria and comparable cultural contexts by the examination of the relationship between loneliness and PMDD. The findings of this study have the potential to contribute significantly to the development of effective therapeutic strategies that address the complex interplay between loneliness and PMDD, ultimately enhancing the overall well-being of affected individuals.

## **2. Methods**

### **2.1. Study Population**

For this study, the undergraduate students at Lagos State University are the target population with a population size of 29,991. The female students of this group were selected as it was determined to consist of females within the reproductive age range. The group was also selected due to their perceived high intellectual ability, particularly their ability to read, understand, and respond adequately in English Language. Further, their geographical closeness to the researcher makes them an appealing choice.

### **2.2. Data Collection**

An ethical approval was obtained from the Covenant Health Research Ethics Community (CUHREC), in line with the standard for ethical consideration. The researcher met the students during their free time within the academic area and residential area to prevent disruption of their academic activities and minimise unwillingness to respond or hasty responses to the questionnaire. The researcher was then introduced to the participants and informed them of the purpose of the research. The participants were then assured that all provided information would be held in confidence and utilized strictly for research purposes.

The informed written consent of the participants was then sought. The participants were also encouraged to respond sincerely to the questionnaire, after which they were given the go-ahead to proceed responding. The data was collected over a period of two days. A total of 420 questionnaires were distributed to female undergraduate students in Lagos State University. There was an attrition rate of 6.43% among respondents. Of the distributed questionnaires, 393 female students responded to the questionnaire and after filtering data for invalid and missing responses, the dataset was reduced to 386 valid responses.

### **2.3. Instruments**

The data utilised in this study was drawn from primary data and collated via the use of questionnaires. The questionnaires were self-report questionnaires, filled by the respondents. The questionnaire will consist of four sections: a Demographic Information section and two different standardised instruments. Each instrument independently measuring one variable. The instruments were adopted for the study in the questionnaire are the Premenstrual Symptoms Screening Tool (PSST), and the 8-item Loneliness Scale by the University of California, Los Angeles (ULS-8).

The Premenstrual Symptoms Screening Tool, commonly known as the PSST, is a standardised tool developed by Steiner et al. (2003). The instrument was developed to enable quick and effective detection and assessment of the severity and impact of premenstrual symptoms. It consists of 19 items and uses a Likert scale of 1 to 4 for measuring responses. Each item uses a Likert scale corresponding with options for Not at all, Mild, Moderate, and Severe. Each option

corresponds to respective values of 1, 2, 3 and 4. The severity of premenstrual symptoms can be measured using the total score of items. The screening for PMDD required three criteria to be met. First, at least one item from one to four should be scored Severe. Second, four or more items from item one to item fourteen should be rated either Moderate or Severe. Third, at least one item should be Severe in items fifteen to nineteen. Okoli et al. (2023) conducted a study that validated the English version of the scale for use in Nigeria. They report good test-retest reliability and a Cronbach's co-efficient alpha (0.796) for its reliability coefficient.

The second scale employed in the study is the 8-item University of California, Los Angeles Loneliness Scale to measure loneliness. It is known as either the ULS-8 or the 8-item UCLA Loneliness Scale. The University of California, Los Angeles Loneliness Scale (ULS) originally developed by Russell et. al in 1978 was revised into the ULS-8 by Hays and Dimatteo (1987). It measures subjective loneliness and feelings in participants and consists of 8 items. The response to the questionnaire is made using the 4-point Likert scale with possible responses corresponding to Never, Rarely, Sometimes and Always.

The items "I lack companionship", "There is no one I can turn to", "I feel left out", "I feel isolated from others", "I am unhappy being so withdrawn", and "people are around me but not with me" are negatively worded and indicate for loneliness in the respondent. These 6 items are scored from 1 to 4 depending on the response. "Never" has a score of 1, "Rarely" a score of 2, "Sometimes" a score of 3, and "Always" a score of 4. The scoring scales for the remaining two items "I am an outgoing person" and "I can find companionship when I want it" are reversed with "Always" scored 1, "Sometimes" 2, "Rarely" scored 3 and "Never" scored as 4.

The scores of the 8 items are then added together to give the loneliness score, which ranged from a minimum of 8 to a maximum of 32. Total scores of 8 to 13 are considered to indicate low levels of loneliness, total scores of 14 to 20 are considered to indicate normal to moderate levels of loneliness, total scores of 21 to 25 are considered to indicate moderate to high levels of loneliness, and total scores of 26 to 32 are considered to indicate high levels of loneliness. Hays and Dimatteo (1987) reported a homogeneity score of 0.4 for the scale and a Cronbach's alpha of 0.84.

#### **2.4. Data Analysis**

The variables and study objectives were considered when organising and analysing the data gathered for the investigation. The IBM SPSS Statistics v. 23 was utilized to analyse the data gathered via the questionnaire. Descriptive statistics was conducted on the data using the IBM SPSS Statistics v. 23. Making use of the IBM SPSS Statistics v. 23, the following analyses were conducted: frequency analyses and regression. Frequency analysis was used to the baseline characteristics. While regression analysis was also conducted to test the

hypothesis that loneliness is not significant predictors of PMDD. Results with a P value less than 0.05 were considered statistically significant.

### 3. Results

#### 3.1. Baseline Characteristics

Table 1 shows the age frequencies among participants in this study. The participants were between the ages of 15-30, and each number of years were grouped. The age range of 15-19 was used in this study, which was 36.3% of the sample, the age range 20-24 was also used in the study, consisting of 56.7 % of the sample, and the age range of 25-30 was used in this study making up 7.0% of the sample.

It also shows the frequency in the undergraduate levels of study the participants were undergoing at the time of study. 83 100-level undergraduate students were surveyed in this study, which was 21.5% of the sample, 117 undergraduate students in 200 level students were also used in this study, which was 30.3% of the sample, 77 undergraduate students at 300 level were used in this study, which was 19.9 % of the sample and 400 level undergraduates were 109 in number consisting of 18.2 % of the participants of the study.

Table 1 showcases the frequency of ethnicity of the participants of this study. Persons of Yoruba ethnicity numbered 300 and consisted of 77.7 % of the sample. Persons of Igbo ethnicity numbered 46 and comprised 11.9% of the study participants. Persons of Hausa ethnicity numbered 10 and consisted of 2.6 % of the sample. While persons of other ethnicities numbered 30 and comprised 7.8 % of the study sample.

Table 1 also shows the frequency of the relationship status of the participants of this study. There were 308 single participants who consisted of 79.8 % of the sample. 68 participants were in dating relationships and comprised 17.6% of the study sample. While 10 participants were married and consisted of 2.6 % of the study sample.

**Table 1.** Table of Characteristics

	<b>Classification</b>	<b>N</b>	<b>%</b>
Age	15-19	140	36.3
	20-24	219	56.7
	25-30	27	7.0
	Total	386	100.0
Level of study	100 level	83	21.5
	200 level	117	30.3
	300 level	77	19.9
	400 level	109	18.2
	Total	386	100.0
Ethnicity	Yoruba	300	77.7



	Igbo	46	11.9
	Hausa	10	2.6
	Others	30	7.8
	Total	386	100.0
Relationship status	Single	308	79.8
	Dating	68	17.6
	Married	10	2.6
	Total	386	100.0

### 3.2. Impact of Loneliness on PMDD.

Table 2 records the results of a regression analysis to investigate the influence of loneliness on premenstrual dysphoric disorder. The regression model had an R of 0.127 with a likelihood of statistical insignificance of less than 0.05, indicating that loneliness is likely a significant predictor of premenstrual dysphoric disorder severity. In addition, regression found a significant predictive effect [ $F(1, 385) = 6.337, p < 0.05$ ], with the regression model indicating it accounted for 1.6% of the variance in premenstrual dysphoric disorder symptoms ( $R^2 = 0.016$ ). The findings indicate that loneliness is a significant predictor of premenstrual dysphoric disorder symptoms among women, highlighting the importance of addressing loneliness in clinical interventions for premenstrual dysphoric disorder.

**Table 2.** Overall Loneliness Model Evaluation

Model	Regression	Source of variation	Sum of squares	df	Std Error	Mean square	F	Sig.
	R = 0.127a	Regression	0.888	1.000	0.025	0.888	6.337	0.012b
	$R^2 = 0.016$	Residual	54.827	384.000		0.140		
	$R^2(\text{adj}) = 0.014$	Total	54.715	385.000				
<b>a. Predictors: (Constant) Loneliness</b>								
<b>b. Dependent Variable: Premenstrual Dysphoric (PMDD)</b>								

### 4. Discussion

This study has investigated the impact of loneliness on premenstrual dysphoric disorder (PMDD) among female undergraduates at Lagos State University. The study's findings indicated that loneliness is a significant predictor of PMDD.

These findings are supported by the various conducted studies including the study conducted by Takeda et al. (2023) to examine the association between

loneliness and premenstrual symptoms during COVID-19 pandemic among adolescent females in Japan. Its results indicated that loneliness has a positive relationship with premenstrual symptoms. It was also supported by a study conducted in China by (Jung Jae Lee et al., 2024) to examine the relationships between menstrual and the risk of premenstrual dysphoric disorder among young women.

The findings are further supported by the longitudinal study of Giacco, (2022). Its results report that loneliness predicts the onset of depression and also a relapse to a depressed state. The findings were also supported by the study conducted by Jensen-Campbell et al., (2023) to investigate the influence of social support and loneliness on mental health in US emerging adults during the pandemic. Its findings indicated that loneliness predicted the occurrence of depression among individuals.

This suggests that loneliness is a risk factor for premenstrual dysphoric disorder. Therefore, the occurrence of feelings of loneliness in an individual increases the predisposition of the individual to premenstrual dysphoric disorder. Therefore, to reduce the likelihood of occurrence of premenstrual dysphoric disorder during the luteal phase and the menstrual phase of the menstrual cycle, loneliness as one of the risk factors needs to be mitigated.

#### **4.1 Implications of Study**

The results of this study have important ramifications for lawmakers, university officials, and mental health specialists who want to enhance the well-being of female students. Through the identification of loneliness as a contributing factor to PMDD, this study emphasises how important it is for educational institutions to provide social support services. Peer mentoring programs and student-run support groups that promote community development and offer both high-quality and high-quantity social interaction are a few examples.

Additionally, the study emphasises how important it is to incorporate mental health education into university syllabuses. Since many students with PMDD might not understand the connection between loneliness and their symptoms, they might not seek the right kind of help. Creating a more encouraging learning atmosphere while empowering students to recognize and control their symptoms by increasing awareness of premenstrual dysphoric disorder and loneliness through workshops and campus outreach initiatives. Clinical professionals should take loneliness into account as a psychosocial component while diagnosing and treating PMDD. This is on top of the currently used hormonal treatments and medicinal interventions such selective serotonin reuptake inhibitors (SSRIs). Although physical symptoms may be lessened by these therapies, therapeutic approaches may be more successful if psychological issues like loneliness are addressed. addressing the underlying cause, perhaps.



#### **4.2 Limitations of the Study**

This research experienced various limitations that constrained the study's conduction including a limitation on its geographic scope. The study focused on female undergraduate students at Lagos State University. However, undergraduates who experience PMDD, and loneliness likely exist in other universities of Lagos, Nigeria and the world at large. This limitation of the population makes it difficult to generalise the results of the study to the federal and private universities in Lagos and the various states consisting of the entity of Nigeria, which also possess undergraduate students.

The study was also conducted in a limited way due to financial constraints. There were limited funds, which prevented the collection of data from all three state universities in Lagos State. This narrowed the sample to being from one state university. The study made use of convenience sampling, which is a non-probability sampling method. Convenience sampling was used to determine the university, while convenience sampling, in combination with voluntary response sampling, was used to determine the individual participants. A primary reason for employing these two sampling techniques instead of a probability sampling method, such as random sampling, was that consent from the participants was a vital necessity in the study. The limitation of time prevented the conduct of a longitudinal study. A longitudinal study of the impact of loneliness and PSS on PMDD would have enabled a more holistic observation of the influence loneliness has on premenstrual dysphoric disorder over a period of time. A longitudinal study would have also revealed the progression of premenstrual dysphoric disorder.

#### **4.3 Suggestions for Further Studies**

Future conducted studies can make use of longitudinal design to have a greater perspective on the influence of loneliness over a period of time. A longitudinal study can investigate the onset and progression of premenstrual dysphoric disorder in relation to loneliness. Also, research should be conducted to explore the various mechanisms at play via which loneliness in an individual predicts premenstrual dysphoric disorder. It is also suggested that future studies cover a larger geographical area of Nigeria and Africa as a whole to identify the various sociodemographic factors affecting the occurrence of PMDD amongst females. The research could investigate the effect of factors such as economic class, access to medical assistance and informational resources, age groups, and occupation, among others.

#### **5. Conclusion**

This study emphasises how important loneliness is in the development of PMDD and how important social support networks are in reducing emotional distress in female students. Addressing loneliness through focused interventions could greatly enhance general well-being in university populations, especially

considering the strong influence of psychosocial factors on menstrual health. The intricacy of PMDD and its connection to psychosocial factors should be further investigated in future studies, which will offer evidence-based preventative and intervention techniques for both academic and clinical contexts.

In order to enhance mental health outcomes and lower the prevalence and severity of PMDD among young women, educational institutions and healthcare practitioners can provide a welcoming and supportive environment for female students. Eventually, in order to ensure that people with this illness are effectively managed and supported, a comprehensive strategy that incorporates medical, psychological, and social viewpoints will be crucial.

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