Prevalence and Approaches to Managing Premenstrual Syndrome Among Female Students in a Private University, Kenya

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ABSTRACT

Premenstrual syndrome (PMS) is a common occurrence experienced by most women before and during their menstrual period. It refers to the emotional, physical, behavioral, and cognitive symptoms that appear during luteal phase of the menstrual cycle then disappears shortly after onset of menstruation. Around 58.1% of Turkish university students and 53.87% of female students in Ethiopia experience PMS. The condition is widely spread affecting 95.5% of female nurses in Nairobi, Kenya. Different management interventions have been used to manage PMS symptoms including use of painkillers and massage but; information on how University students manage the symptoms is either limited or completely lacking. A clear understanding of these approaches would help promote academic and personal well-being while; enhancing gender sensitive healthcare support. This study aimed to investigate the prevalence of premenstrual syndrome (PMS) and commonly employed management strategies among female students enrolled at Kabarak University in Kenya. A cross-sectional descriptive study was conducted among 356 female students at Kabarak University from January to April 2023. Subjects were recruited using simple random sampling technique. Standardized close-ended questionnaires were used to collect data on prevalence and commonly used medical interventions. A total of 316 valid responses were obtained representing an 88.76% response rate. Majority of study subjects were between the ages of 18-23, single, and in their first year of education. Prevalence of PMS among the participants was found to be high, with 86.7% reporting experiencing PMS symptoms. The most common duration of menstrual cycles reported was 4-6 days. The majority of participants (63.9%) used some form of treatment to manage PMS symptoms, with medication being the most commonly employed approach (51.3%). Non-pharmacological interventions such as sleeping and warm/cold showers were also frequently utilized. In conclusion, PMS prevalence was high at the university highlighting the need for increased awareness and support for female students. Additionally, tailored interventions that address the diverse needs and preferences of the students are crucial for effectively managing their PMS symptoms. Based on the study results and discussions, we recommend recognition of PMS as a health priority among female students. The university health center should maintain ample supplies of effective medications such as Ibuprofen, Paracetamol, and Hyoscine Butylbromide, which demonstrated significant symptom reduction among most female students..

Keywords: premenstrual syndrome, Kabarak university, menstruation, NSAIDs.

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INTRODUCTION

Premenstrual syndrome (PMS) encompasses emotional, physical, behavioral, and cognitive symptoms manifesting during the luteal phase of the menstrual cycle, subsiding shortly after the onset of menstruation (Tolossa & Bekele, 2014). The menstrual cycle begins with the follicular phase followed by the ovulatory phase where ovulation takes place, around day 14. The luteal phase begins after ovulation and goes on until the menstrual phase where menstruation occurs. The syndrome is characterized by cramps, aches, bloating, change in appetite or food cravings, mood swings, swollen breasts and tenderness, anxiety and decreased interest in daily activity (Gudipally and Sharma, 2023). In severe forms, PMS results in premenstrual dysphoric disorder (PMDD) which is a mental disorder as defined by the Diagnostic and Statistical manual of Mental Disorders (Zachar& Kendler, 2014). The severe and disruptive manifestations of pre-menstrual syndrome are collectively referred to as Pre-Menstrual Dysphoric Disorder. The exact cause of PMS remains unclear. However, several factors have been implicated in its occurrence: hormonal imbalances, neurotransmitter fluctuations, genetics, and psychosocial factors (Rapkin & Akopians, 2012).

Hormonal fluctuations that influence the four phases of the menstrual cycle significantly contribute to the associated symptoms. In the follicular phase, the anterior pituitary, under the influence of gonadotropin-releasing hormone (GnRH), releases Follicle Stimulating Hormone (FSH) (Chisholm-Burns et al., 2016). Additionally, Luteinizing hormone (LH) is synthesized, and the concentrations of both FSH and LH peak just prior to ovulation. FSH plays a role in promoting follicle growth, while LH facilitates the maturation of the oocyte and triggers ovulation (Chisholm-Burns et al., 2016). Following ovulation, during the luteal phase, the corpus luteum secretes estrogens until approximately two days before menstruation. Estrogens exert a negative feedback mechanism on the pituitary and hypothalamus, suppressing the secretion of FSH and LH during the latter phases of the menstrual cycle (Tripathi, 2013). Due to the fluctuating concentrations of these hormones, there are predictable symptoms associated with each phase of the menstrual cycle. In the luteal phase, characterized by high levels of estradiol and progesterone, these symptoms culminate in a syndrome referred to as pre-menstrual syndrome (PMS) (Tripathi, 2013).

Determining the absolute prevalence of PMS poses challenges due to various factors such as self-treatment practices, disparities in access to medical care, variations in definitions and diagnostic criteria, and cultural factors. Nevertheless, existing research suggests that PMS affects approximately 80% to 90% of the global female population, with approximately 3% to 8% experiencing severe symptoms (Matsumoto et al., 2013). A systematic review and meta-analysis study conducted in Ethiopia found that 53.87% of university students and 56.19% of high school students reported experiencing PMS (Geta et al., 2020). However, it's important to note that there is scarce information regarding the prevalence of PMS among female students in Kenya. This underscores the necessity for a comprehensive characterization of the condition to facilitate development of targeted interventions.

Throughout history, females experiencing premenstrual syndrome (PMS) have employed a myriad of multimodal approaches tailored to their individual needs to alleviate PMS symptoms and enhance overall quality of life. The choice of interventions is contingent upon the severity of symptoms and personal preferences. Management strategies encompass a range of options, including but not limited to lifestyle modifications, such as regular exercise, a balanced diet, stress reduction techniques, and ensuring adequate sleep (Ryu & Kim, 2015).

Furthermore, pharmacological interventions are frequently employed to address specific symptoms associated with PMS. These may encompass nonsteroidal anti-inflammatory drugs (NSAIDs), hormonal contraceptives, and selective serotonin reuptake inhibitors (SSRIs) (Ryu & Kim, 2015). SSRIs, which are commonly used as antidepressants, are often prescribed to mitigate the severity of emotional and physical symptoms related to PMS. NSAIDs, available over-the-counter, include medications such as Ibuprofen, Naproxen, Meloxicam, and Mefenamic Acid, and they are effective in relieving physical symptoms like breast tenderness, cramps, and headaches associated with PMS. The aforementioned interventions can be employed individually or in combination, depending on the severity of the condition and the specific needs of the individual.

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Despite various surveys indicating widespread use of the aforementioned interventions, there remains a dearth of specific data regarding how female students manage their PMS symptoms, necessitating further exploration. This study thus sought to investigate the prevalence of PMS and the strategies employed for its management among female students at Kabarak University.

METHODOLOGY

Study Location

The study was conducted at Kabarak University main campus which is located in Nakuru county, along Nakuru-Eldama-ravine road, 20 kilometers from Nakuru town. The University has more than 5000 female students who are within the age range of experiencing PMS. This therefore made it an ideal location for this study.

Research Design

A cross-sectional descriptive study approach according to Setia (2016) was employed. This entailed collection of data on PMS management strategies from a subset of the female students and generalizing the findings among populations with similar demographics. The data were collected between January to April 2023.

Study Population

The study population for this research comprised undergraduate and postgraduate female students aged 18 years and above. Only full-time enrolled students who provided informed consent were eligible for participation. However, female subjects who were currently on hormonal contraceptives or pregnant at the time of the study were excluded from participating to ensure the data's accuracy and relevance to the objectives of the research. The high number of eligible female students at the university offered a suitable and sufficient sample size for the study.

Sample Size Determination

A sample size of 356 was calculated using Cochran's formula (Cochran, 1963) at a prevalence rate of 50%. The total sample size was further moderated because the target population was less than 10,000.

Sampling and Data Collection Procedures

For participant recruitment, a simple random sampling technique was used. The data collection instrument consisted of self-administered questionnaires with multiple closed-ended questions aligned to the research objectives. Data on demographic characteristics, frequency of PMS symptoms occurrence, and management interventions employed to manage PMS were collected. To ensure accessibility and convenience, the questionnaire was administered via Google Forms and shared through various university platforms, including the school email and class WhatsApp groups of different academic programs. Before the main data collection, a pilot study involving 10% of the study participants was conducted at Rafiki Market. This pilot aimed to validate and ensure the reliability of the research instruments, making any necessary adjustments before the actual data collection. The research team then proceeded with the data collection process using the refined questionnaire to gather relevant information from the selected participants.

Data Collection Instruments

The data were collected using a questionnaire in which variables related to menstruation were evaluated among the study population. Questions consisted of demographic characteristics of the study participants, prevalence of PMS and management interventions used to manage the PMS symptoms. The first variable was the duration of menses, categorized into three groups: 1-3 days, 4-6 days, and more than 6 days. The second variable was the presence of PMS, with participants asked to indicate whether they experience symptoms of PMS or not. These variables determined the prevalence of PMS. Another variable assessed was whether study participants used medication or not to manage their PMS symptoms.

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Data Analysis

Collected data were then entered into an excel file where data cleaning and coding was done. The excel file was then exported to the statistical package for social sciences (SPSS) version 27 for analysis. Descriptive statistics (mean, mode and median) were used. Analyzed data were presented in form of graphs, tables and charts.

Ethical Considerations

Permission to conduct the study was obtained from the School of Pharmacy. Ethical approval of KUREC-100323 was sought from Kabarak University Research Ethics Committee. Permit for data collection was obtained from National Commission for Science, Technology and Innovation NACOSTI/P/23/25342. Permission to access target population from Kabarak University was obtained from the management team. All responses were anonymized to conceal the identity of participants and ensure privacy and confidentiality. All data collected were kept under a password protected device, encrypted with a strong password from the time of collection, storage and analysis to safe discard after 5 years using secure disposal methods such as by permanent deletion. The data were only accessed by the principal researchers. The authors declare no conflicts of interest.

RESULTS

Response Rate

Out of the three hundred and fifty-six participants invited, only three hundred and sixteen acknowledged the invite to be assessed for their PMS demographics and details. This represents an 88.76% response rate. According to Holtom et al. (2022), a good response rate is considered to be above 65%. Therefore, the response rate in this research study was considered to be satisfactory.

Socio-Demographic Characteristics

Of the total 316 participants, majority (43.4%) were between the ages of 18-20, followed by those between 21-23 years (41.5%). Most participants (97.5%) reported being single, and the largest proportion (33.9%) were in their first year of education. Regarding academic programs, the largest proportion of participants were enrolled in SMHS (10.8%) and EDUC (16.1%), followed closely by SSET (18.7%). Finally, a total of 28.5% of participants reported being enrolled in other academic programs not specified in the table. It is worth noting that majority of participants were in their undergraduate studies, with only 10.8% being in postgraduate programs.

Table 1:
Study Subjects' Socio Demographic Characteristics

Variable	n (%)
Age (years)	
18-20	137 (43.4%)
21-23	131 (41.5%)
24-26	40 (12.7%)
>26	8 (2.5%)
Marital status	
Single	306 (97.5%)
Married	8 (2.5%)

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Variable	n (%)
Year of education	
First year	107 (33.9%)
Second year	49 (15.5%)
Third year	48 (15.2%)
Fourth year	49 (15.5%)
Fifth year	29 (9.2%)
Postgraduate	34 (10.8%)
Course	
SMPA	4 (1.3%)
SMHS	34 (10.8%)
SSET	20 (6.3%)
EDUC	51 (16.1%)
SoP	59 (18.7%)
SBE	26 (8.2%)
SoL	32 (10.1%)
OTHER	90 (28.5%)

SMHS: School of Medicine & Health Sciences; SSET: School of Science, Engineering Technology; EDUC: School of Education; SoP: School of Pharmacy; SBE: School of Business & Economics and; SoL: School of Law.

Prevalence of Pre-Menstrual Syndrome (PMS)

The majority of participants (53.5%) reported a menses duration of 4-6 days, while 41.5% reported a duration of 1-3 days, and only 5.1% had their menses for more than 6 days. The results show that 86.7% of the participants reported experiencing PMS symptoms, while 13.3% did not report experiencing PMS symptoms.

Table 2:
Prevalence of PMS Among Study Subjects

Variable	n (%)
Duration of menses (days)	
1-3	131 (41.5%)
4-6	169 (53.5%)
>6	16 (5.1%)
Presence of premenstrual syndrome	
Yes	274 (86.7%)
No	42 (13.3%)

Management Approaches of Pre-Menstrual Syndrome

Table 3 below represents variables on management interventions used to manage PMS by the study participants. A majority of the participants (63.9%) used some form of treatment to manage PMS. The second variable was the type of medication used by those who reported to use medication. Among the 63.9% who used treatment; 51.3% used medication, 44.9% used non-medication approaches while 3.81% used other ways that are not specified below.

Table 3:
Management Interventions of Pre-Menstrual Syndromes (PMS)

Variable	n (%)
Treatment/ medication use	
Yes	202 (63.9%)
No	114 (36.1%)

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Variable	n (%)
Type of treatment	
Medication	162 (51.3%)
Non-medication	142 (44.9%)
Other	12 (3.8%)

The Pharmacological Interventions of Pre-Menstrual Syndrome

On pharmacological intervention, majority of the study participants (n=134) reported using Hyoscine-N-butylbromide (scopolamine butylbromide) followed by Paracetamol (n=127). Ibuprofen was used by 112 participants. Only a few (n=75) reported using Diclofenac while Mefenamic Acid (n=40) was the least used pharmacological medication for Pre-menstrual Syndrome.

Figure 1:

Pharmacological Interventions of Pre-Menstrual Syndrome


If pharmacological/ medication
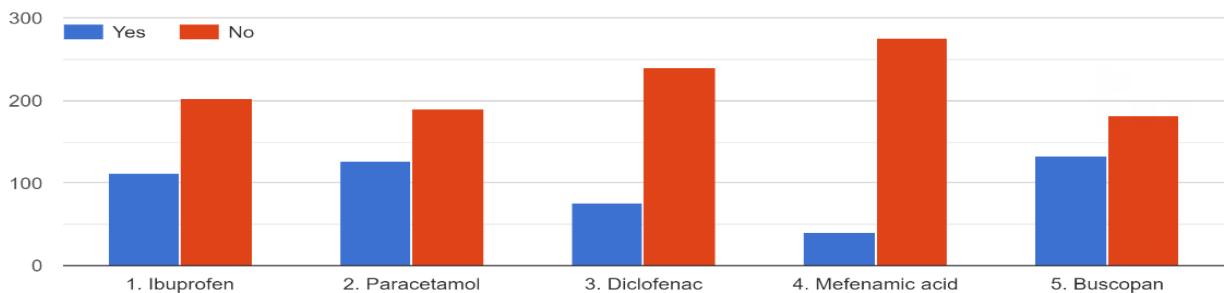
The Non-Pharmacological Interventions of Pre-Menstrual Syndrome

Common non-pharmacological interventions for Pre-menstrual Syndrome that were assessed were massage, diet change, sleeping, yoga, gym and aerobics and warm/cold shower. A total of 259 respondents preferred sleeping as a way to relive their PMS symptoms. They were followed by those who employ warm/cold shower (n=245). Massage can in third (n=175) while diet change (n=125) was fourth in line. Yoga (n=57) followed by gym and aerobics (n=55) were the least used non-pharmacological interventions for Pre-menstrual Syndrome.

Figure 2:

Non-Pharmacological Interventions of Pre-Menstrual Syndrome

If non-pharmacological

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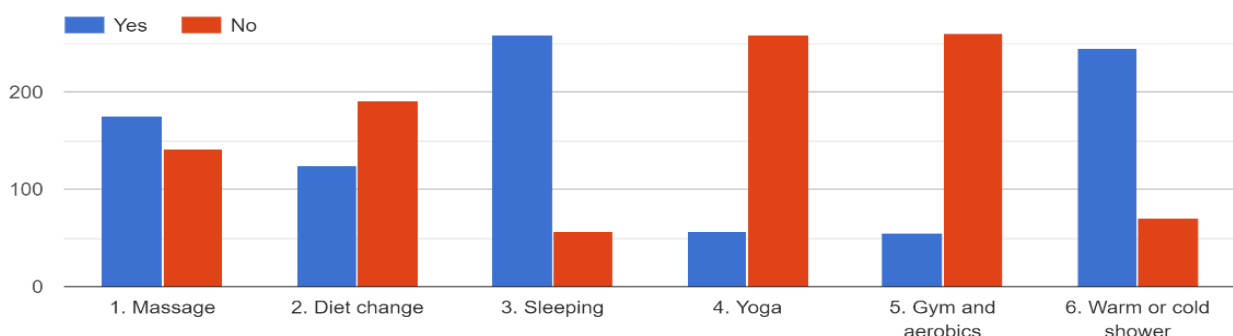
DISCUSSION

The primary objective of this study was to investigate the prevalence of premenstrual syndrome (PMS) and the commonly employed management strategies among female students enrolled at Kabarak University in Kenya. A total of 316 students participated in this study, which was drawn from a targeted sample size of 356. This sample size was considered sufficient to draw meaningful inferences, as it represented a robust response rate exceeding 65%, as emphasized by Holtom et al. (2022). Among the 316 participants, the majority fell within the 18-20 age bracket (43.4%). This demographic pattern is consistent with the university's typical student population, as these ages correspond to undergraduate studies. The next largest age group comprised individuals aged 21-23, accounting for 41.5% of the participants. Interestingly, a significant portion (33.9%) of those reporting PMS symptoms were in their first year of study. In comparison, a study conducted by Ackigoz et al. (2017) at Eylul University in Turkey found that 58.1% of first-year students experienced PMS. Furthermore, the vast majority of participants (97.5%) reported being single, which eliminates the possibility of factors such as pregnancy or contraceptive use among married individuals affecting their menstrual cycle and potentially influencing the collected data. Among the academic programs, the School of Science, Engineering, and Technology had the highest enrollment, accounting for 18.7% of the participants, followed closely by the School of Education at 16.1%.

Regarding the prevalence of PMS, the study revealed that a substantial majority of participants (86.7%) reported experiencing symptoms associated with premenstrual syndrome. This notably high prevalence rate underscores the importance of addressing PMS among female students at Kabarak University, as it may have implications for their academic performance. In comparison, a study conducted by Geta et al. (2020) in Ethiopia found that 53.87% of university-going females reported experiencing PMS. Similarly, a study by Bhuvaneswari et al. (2019) indicated that 62.7% of female students at Puducherry College experienced PMS. These findings collectively suggest that a significant proportion of female students in the reproductive age group encounter PMS symptoms. Additionally, the study identified that the most common duration of the menstrual cycle among participants was 4-6 days, accounting for 53.5% of the responses, followed by a duration of 1-3 days, which was reported by 41.5% of the participants. Only a small proportion (5.1%) reported a menstrual cycle duration exceeding 6 days. These findings align with those of Patil et al. (2018), which also reported that the majority of adolescent females have menstrual cycles lasting 4-6 days.

Throughout the menstrual cycle, the presence of associated pain, mood swings, and other symptoms necessitates symptomatologic interventions to enable females to continue with their daily activities. In terms of management interventions, this study identified that a majority of participants (63.9%) utilized some form of treatment to address their PMS symptoms, underscoring the importance of recognizing PMS as a significant health concern. Among those who sought treatment, medication was the most commonly employed approach (51.3%), followed by non-medication interventions (44.9%). It's worth noting that a small proportion (3.8%) reported using unspecified methods for symptom management. The pharmacological interventions reported by the participants included the use of medications such as buscopan, paracetamol, ibuprofen, diclofenac, and mefenamic acid. Buscopan emerged as the most frequently used medication for PMS (n=134), followed by paracetamol (n=127) and ibuprofen (n=112). Diclofenac and mefenamic acid were less commonly utilized by participants. The use of medication, particularly non-steroidal anti-inflammatory drugs (NSAIDs) and oral contraceptives, for managing PMS symptoms has been documented in multiple studies (Bakhshayesh et al., 2020; Rapkin, 2003).

Furthermore, non-pharmacological interventions were also assessed, with strategies such as getting adequate sleep (n=259) and taking warm/cold showers (n=245) being the most commonly employed methods. Massage was utilized by 175 participants, while dietary changes, yoga, gym, and aerobics were less frequently chosen options. Importantly, studies conducted by Kafaei-Atrian et al. (2019) and Bakhshayesh et al. (2020) have similarly suggested that non-pharmacological interventions such as cognitive-behavioral therapy, relaxation techniques, and dietary adjustments are effective in managing PMS symptoms. These findings underscore the significance of recognizing PMS as a notable health concern within the university setting and emphasize the need for tailored interventions to support female students in effectively managing their PMS symptoms.

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CONCLUSIONS

We conclude as follows:

- Majority of the participants were aged between 18-21 years with most of them being in their first year of study. From this, 53.5% reported a menses duration of 4-6 days.

- The prevalence of PMS among study participants was 86.7%.

- Ibuprofen, acetaminophen and *Hyocine butylbromide* were the commonly used medications to manage PMS symptoms. Non-pharmacologically, most of the participants depended on strategies such as sleep, massage, and warm or cold showers to alleviate their PMS symptoms.

RECOMMENDATIONS

Based on the study's findings and subsequent discussion, we recommend that PMS be recognized as a significant health concern within the university setting, given its notably high prevalence among female students. Furthermore, health centers within institutions of higher learning should ensure ample and consistent availability of medications such as Ibuprofen, acetaminophen and *Hyocine butylbromide*, as these were found to be effective in reducing PMS symptoms for the majority of female subjects.

Conflict of Interest

Authors declare no conflict of interest.

Author Contributions

The contribution of the authors is as follows: AR: study conceptualization, data collection, data analysis, manuscript writing and revision, handles all correspondence regarding this article; VK: study conceptualization, data collection, data analysis, manuscript writing and revision; BB: study conceptualization, data collection, data analysis, manuscript writing and revision, MW: review of the manuscript and general supervision of the study.

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