Effects and coping mechanisms associated with Premenstrual Syndrome among female University Students in Central Uganda: A Cross-sectional Study.

Elizabeth Atim[a,*], Florence Nabushawo Okecho[a], Regina Ndagire[b], Catherine Lwanira Nassozi[b]

[a]*School of Nursing and Midwifery, Clarke International University, Kampala, Uganda.*
[b]*School of Graduate studies, Research and Innovation, Clarke International University., Kampala, Uganda.*

Abstract

Background

The cyclic nature of Premenstrual Syndrome (PMS) affects those with severe symptoms in ways that make them incapacitated or inefficient every month impairing their quality of life. This problem in Uganda is compounded by the cultural stigma associated with menstruation making it difficult for ladies and communities to address the associated problems. Therefore, this study sought to identify how Premenstrual Syndrome affects the quality of life of female University students in Central Uganda in terms of effects and coping mechanisms.

Methodology

A cross-sectional study was carried out using a questionnaire between November 2021 and May 2022. 238 participants from 4 universities who met the inclusion criteria were given self-administered questionnaires on PMS symptoms, effects and coping mechanisms. The data was analysed to obtain frequencies and percentages. Statistically significant associations between PMS and Effects of PMS as well as the Coping mechanism were determined using Chi-square correlations.

Results

At least 70 (33%) of the 212 respondents reported that the PMS symptoms affected either their school and/or their relationships or their daily activities plus home chores. Statistically significant effects of PMS on school efficiency were: sleeping in class $\chi 2(1, n=212) = 4.957$, $p=0.026$; and being late on assignments $\chi 2(1, n=212) = 6.279$, $p=0.012$.

Coping mechanisms that were found to be statistically significantly associated with PMS at α-level of 5% were: hiding or locking self in a room $\chi 2(1, n=212) = 4.846$, $p=0.028$; taking alcohol $\chi 2(1, n=212) = 5.115$, $p=0.024$; seeing a health worker $\chi 2(4, n=212) = 14.201$, $p=0.007$; and taking pain killers $\chi 2(1, n=212) = 5.202$, $p=0.03$.

Conclusion

PMS was significantly affecting school efficiency of students.

Recommendation

There are still huge knowledge gaps about PMS that need addressing.

Some students reported that they used herbal preparations for PMS symptoms which need to be investigated for potential pharmaceutical development.

Keywords: Premenstrual Syndrome (PMS), PMS Effects, Coping Mechanisms, Female University Students, Uganda, Date Submitted: 2022-07-29 Date Accepted: 2022-08-10

1. Background

Imagine a scenario "where a woman's very own menstrual cycle predisposes her to monthly inefficiency or reduced productivity just because she is unaware that the symptoms she has cannot only be treated but be prevented as well. As such, she losses opportunities and time, and settles for less because she believes that it is her fate to suffer for having a menstrual cycle." This is the ordeal of the women and students who ignorantly suffer premenstrual syndrome (PMS) and its associated problems.

Premenstrual Syndrome (PMS) is described as a group of affective, physical, and behavioural symptoms that occur in a female's body before the onset of menstruation (Lobo & Pinkerton, 2010; Quintana-Zinn *et al.,* 2017). The cyclic condition affects those with severe symptoms in ways that make them incapacitated or inefficient every month impairing their quality of life (Durairaj & Ramamurthi, 2019; Molugulu *et al.,* 2016; Naeimi, 2015; Nooh *et al.,* 2016; Oo *et al.,* 2016; Victor *et al.,* 2019).

PMS affects all aspects of health and life, that is: Physically, Mentally, Socially, and Environmentally (Victor *et al.,* 2019). Specifically, students have previously reported a loss of concentration, class absenteeism, and not attending social gatherings/functions (Oo *et al.,* 2016; Shamnani *et al.,* 2018). In China, women suffering PMS were continuously abnormally emotional irrespective of the menstrual cycle events (Liu *et al.*, 2017). Students reported that the greatest effect of PMS was on their academic performance (Kalsoom *et al.,* 2018; Tolossa & Bekele, 2014).

Approximately 80% of students with PMS in India reported impaired productivity, while 100% of those with severe PMS (Premenstrual Dysphoric Disorder –PMDD) were inefficient during the luteal phase of the menstrual cycle (Durairaj & Ramamurthi, 2019). Athletes also decrease their participation during this period of the cycle. Some of the reasons given were excessive pain, and nausea (Lydon *et al.,* 2020).

Common PMS coping methods that have been documented include: Sleeping, resting, listening to music, self-medication (Molugulu *et al.,* 2016); use of traditional remedies/herbs (Shahbazi *et al.*, 2020). Other treatment options used by students to manage PMS symptoms include: taking hot drinks, and massage therapy (Tolossa & Bekele, 2014) and; the use of nutritional supplements like fish oils, and evening primrose oils (Molugulu *et al.,* 2016). Students hardly seek professional medical help when suffering from PMS (Durairaj & Ramamurthi, 2019; Molugulu *et al.*, 2016).

While Oral Contraceptive Pills (OCP) were used by some to manage PMS symptoms (Lydon *et al.,* 2020; Molugulu *et al.,* 2016; Shahbazi et al., 2020); in other studies users of OCP had an increased risk of developing PMS symptoms as opposed to the non-OCP users (Akoku *et al.,* 2020). However, in Ethiopia contraceptive use was not statistically significantly associated with PMS among students (Geta *et al.*, 2020).

Analgesics and Non-Steroidal Anti-inflammatory drugs were also used to relieve the PMS symptoms (Shahbazi *et al.*, 2020; Tolossa & Bekele, 2014). The commonly used analgesics used by students during PMS include Paracetamol, Mefenamic Acid, Ibuprofen, and Naproxen (Molugulu *et al.,* 2016).

Although, physical activity among athletes is decreased during the menstrual cycles (Lydon et al., 2020). Physical activity and resistance training has been found to decrease psychological PMS symptoms among students (da Silva & Pires, 2021; Yoshimi *et al.,* 2019) as such many resorts to exercise for relief of PMS symptoms.

PMS is a common disorder among females of reproductive age, which also happens to be the most productive period within the life of a woman. Unfortunately, ladies with this disorder have to endure reduced work productivity, interference with hobbies, increased number of days missed at work or school, increased number of health care visits, increased healthcare costs, and others. Some women suffer the pain and lose positions simply because of ignorance, and poor health-seeking be-

*Corresponding author.
Email address: e.atim@student.ciu.ac.ug (Elizabeth Atim)

haviour (Mohib, *et al.,* 2018).

A Ugandan study carried out among only nulliparous female university students showed a PMS prevalence of over 90%; with 54.7% reporting impairment in the ability to carry out activities of daily living during the luteal phase (Hadija, 2013). These symptoms have in other studies been associated with poor grades/performance, loss of concentration, dropping out of school, missed classes or exams, and relationship problems among university students (Eyob *et al.,* 2016; Hadija, 2013; Tolossa & Bekele, 2014). This problem in Uganda is compounded by the cultural stigma associated with menstruation making it difficult for ladies and communities to address the associated problems. Therefore, this study sought to identify how Premenstrual Syndrome affects the quality of life of female University students in Central Uganda in terms of effects and coping mechanisms.

2. Methods

The methodology of this study is similar to that one used in another study by Atim, et al. (2022). [Prevalence and Severity of Premenstrual Syndrome among Female University Students in Central Uganda: A Cross sectional study]. [Student's Journal of Health Research Africa].

Study Design

Cross-sectional study was carried out using quantitative methods to collect data

Study Area

The area of study was the districts of Kampala and Mukono between November 2021 and May 2022, while students were at the University (not during the holidays).

The study was carried out at Makerere University, Clarke International University, Kampala International University, and Ugandan Christian University.

Inclusion Criteria

All female University students aged 18 and above were eligible to participate in the study. They should have been able to read and write without assistance (without visual or motor impairments) since the instrument was self-administered.

They should have had at least 3 menstrual cycles before the survey.

They should have consented to participate in the study.

Exclusion Criteria

Anyone with a known chronic disease of the reproductive system like fibroids, endometriosis, polycystic ovarian syndrome, and so on was excluded from the study.

Females at the university who had never had menses were excluded from the study.

Students who had already reached menopause were excluded from the study.

Sampling

The respondents were female university students studying in the Universities at the time of data collection. The participants were selected randomly based on university population proportions.

Study Variables

The study variables were Premenstrual Syndrome (PMS) Prevalence as the independent variable; Effects and Coping Mechanisms were the dependent variables.

Data Sources

Primary data from female university students in Central Uganda was obtained and analysed. A self-administered questionnaire was used to obtain information about PMS modified from the DSM-IV criteria (American Psychiatric Association, 2000; American College of Obstetricians and Gynecologists, 2000; Steiner et al., 2003); the effects PMS symptoms have had on the student's quality of life in terms of school work, relationships, and activities/work; the coping mechanisms adopted by the students to deal with the PMS symptoms, as well as why they opted to or not to see a healthcare provider.

Bias

The majority of the respondents were not able to access the internet or data to fill in the online questionnaire. This was handled by making print questionnaires that were delivered to the universities for the respondents to fill.

Using only the questionnaire predisposed the

study to instrument error as there was no triangulation of data. The tool was pre-tested before it was used to ascertain the quality and validity of the data collection instrument/tool. The sample size calculation included the DEFF (Design Effect) to cater for sampling errors.

Sample size

The sample size was determined by the following formula (Daniel, 1999), multiplied by the Design Effect (DEEF) to cater for sampling errors: n = *DEFF

Where: n = Sample size; Z = Z value at 95% Confidence Level (1.96); p = Prevalence of Premenstrual Syndrome estimated at 92.4% was used as the p-value, which was the prevalence of PMS among nulliparous females University Students in Kampala International University Western Campus (Hadija, 2013); d = Desired level of absolute precision; which was set at 5%. Design effect, DEFF, was set at 2 to cater for variance resulting from sampling errors and bias. Assuming a non-response rate of approximately 10%, the sample size was therefore 238 female university students.

3. Data analysis

The data from self-administered questionnaires were coded and entered into Statistical Package for Social Scientists (SPSS version 26) and analysed to obtain descriptive statistics such as frequencies and percentages.

Statistically significant associations between PMS and Effects of PMS as well as the Coping mechanism were determined using Chi-square correlations. Factors were considered significant at the α-level of 5%.

4. Results

Effects of Premenstrual Syndrome

At least 70 (33%) of the 212 respondents reported that the PMS symptoms affected them moderately to severely either at school, in their relationships, or concerning their daily activities and home chores.

The majority whose school was affected reported that their concentration in class was poor (117, 55.2%), while some were not affected at all with regards to their school (53, 25%). See Table 1 for details on how school efficiency was affected by PMS symptoms.

Statistically significant effects of PMS on school efficiency were: sleeping in class $\chi 2(1, n=212) = 4.957$, p=0.026; and being late on assignments $\chi 2(1, n=212) = 6.279$, p=0.012.

Coping Mechanisms associated with Premenstrual Syndrome

Various coping mechanisms were reported by the respondents as shown in Table 3. Although 39(18.4%) did nothing, 116(54.7%) took pain killers, 102(48.1%) slept, while 92(43.4%) rested.

However, the coping mechanisms that were found to be statistically significantly associated with PMS at α-level of 5% were: hiding or locking self in a room $\chi 2(1, n=212) = 4.846$, p=0.028; crying $\chi 2(1, n=212) = 4.931$, p=0.026; listening to music $\chi 2(1, n=212) = 4.846$, p=0.019; taking alcohol $\chi 2(1, n=212) = 5.115$, p=0.024; seeing a health worker $\chi 2(4, n=212) = 14.201$, p=0.007; and taking pain killers $\chi 2(1, n=212) = 5.202$, p=0.03 (see Table 4).

The commonest pain killers that the female University students were taking for PMS symptoms included: Paracetamol (47, 22.2%) Ibuprofen (36, 17.0%), Pyroxicam (34, 16.0%), Mefenamic acid (11, 5.2%), and Diclofenac (7, 22.2%) which are taken either individually or in combination with each other.

To understand the respondents' choice of coping mechanism, they were asked to give reasons why they opted for a particular coping mechanism using the survey questionnaire. The respondents generally either did nothing about their PMS symptoms, or they got a reliever (someone or something that reduced their pain, distress, or discomfort). The following were the findings which are presented thematically in Table 5.

Majority of the respondents sought relief from pain and discomfort; however, some who felt the pain was manageable did not seek medical intervention.

Table 1: **Univariate analysis on Effects of PMS on School Efficiency**

Responses	**Frequency (n=212)**	**Percentage (%)**
Absenteeism	54	25.5
Missed tests	11	5.2
Late on assignments	24	11.3
Poor concentration in class	117	55.2
Sleeping in class	52	24.5
Poor grades	7	3.3
Not affected at all	53	25.0

(Source: Primary Data, 2022)

Table 2: **Bivariate analysis on Effects of PMS on School Efficiency**

Variable	**Category**	**PMS**		**Df**	χ^2	**P-value**
		No (n=152)	**Yes (n=60)**			
Absenteeism	No	118	40	1	2.725	0.099
	Yes	34	20			
Missed tests	No	144	57	1	0.006	0.938
	Yes	8	3			
Sleeping in class	No	121	39	1	4.957	**0.026***
	Yes	31	21			
Poor concentration in class	No	72	23	1	1.420	0.233
	Yes	80	37			
Being late on assignments	No	140	48	1	6.279	**0.012***
	Yes	12	12			
Poor Grades		148	57	1	0.756	0.385
		4	3			

(Source: Primary Data, 2022)

5. Discussion:

Although students reported effects and coping mechanisms, those that were statistically significant were the focus of attention in this discussion. The reason for the use of statistically significant effects and coping mechanisms was because students reported copying mechanisms and effects of not only PMS but also dysmenorrhea which was not part of this study. Many found it difficult to differentiate between PMS and dysmenorrhea effects and coping mechanisms.

Being students, one would worry about the female students' academic or school efficiency being affected by PMS symptoms. Over a third of the students reported that PMS symptoms affected their productivity and relationships. This is lower than most of those reported in other countries, for example, approximately 80% of students with PMS in India reported impaired productivity (Durairaj & Ramamurthi, 2019). Athletes also decrease their participation during this period of the cycle due to excessive pain, and nausea (Lydon *et al.,* 2020).

While PMS affects all aspects of health and life, that is: Physically, Mentally, Socially, and Environmentally (Victor *et al.,* 2019), students in this study reported that they were late on assignments and were sleeping in class. They also reported poor concentration in class although this was not statistically significantly associated with PMS.

Table 3: **Univariate analysis showing PMS coping mechanisms of the respondents**

Responses	**Frequency (n=212)**	**Percentage (%)**
Rest	92	43.4
Sleep	102	48.1
Exercise	36	17.0
See a health worker	53	25.0
Watch a movie	27	12.7
Listen to music	42	19.8
Take a hot bath	51	24.1
Use a hot water bottle	59	27.8
Massage	24	11.3
Find friends to talk to	16	7.5
Hide	23	10.8
Cry	37	17.5
Take home remedies	54	25.5
Take herbal preparations	10	4.7
Take sleeping pills	14	6.6
Take pain killers	116	54.7
Take supplements/vitamins	4	1.9
Have sex	3	1.4
Take alcohol	2	0.9
Smoke	2	0.9
Do nothing and just wait	39	18.4

(Source: Primary Data, 2022)

Table 4: **Bivariate analysis showing coping mechanisms associated with PMS**

Variable	**Category**	**PMS**		**df**	χ^2	**P-value**
		No (n=152)	**Yes (n=60)**			
Hide or lock self in room	No	140	49	1	4.846	**0.028***
	Yes	12	11			
Listen to music	No	128	42	1	5.468	**0.019***
	Yes	24	18			
Cry	No	131	44	1	4.931	**0.026***
	Yes	21	16			
Take Alcohol	No	152	58	1	5.115	**0.024***
	Yes	0	2			
See a Health worker	Yes	28	25	1	12.398	**0.000***
	Never	124	35			
Take painkillers	No	77	20	1	5.202	**0.023***
	Yes	75	40			

***Statistically significant p-value at α- level of 5%.**
(Source: Primary data, 2022)

Table 5: Reasons for not seeing a healthcare worker for PMS symptoms

Themes/Code name	**Definition/Description**	**Frequency**	**Quotations/Examples**
Pain level	The degree of discomfort and distress caused by the symptoms that either causes one to seek help or not to seek help from a healthcare worker	46 (43.8%)	"Because I have no pains" (Respondent 435) "It's a very mild pain which is manageable" (Respondent 127) "The pain is unbearable" (Respondent 360) "My pain is too much" (Respondent 211)
Ignorance	Lack of knowledge about PMS being a condition (lack of awareness).	3(2.9%)	"I didn't know PMS was a thing" (Respondent 229) "Didn't think I had to worry about the condition" (Respondent 339) "Never thought about it" (Respondent 212)
Necessity	When one finds no need to see a physician or healthcare provider because they find no reason to.	14(13.3%)	"I didn't think it's necessary" (Respondent 345) "I usually don't see the reason" (Respondent 237)
Perception of normality	The assumption that PMS pain and its associated symptoms are normal and one must go through them.	29 (27.6%)	"It is normal" (Respondent 402) "Meds are not advisable, the doctor said it's normal to have pains" (Respondent 225). "The doctor told me the pain will only go away when I give birth," (Respondent 101) "The nurse stopped me from taking painkillers," (Respondent 326) "The Doctors don't seem to think it's a problem," (Respondent 341)
Resource unavailability	Failure to access medical care as a result of absence of finances.	5(4.7%)	"No money" (Respondent 213) "Because they (the doctors) are expensive" (Respondent 327)
Privacy	A preference to deal with issues themselves without having to open up about their problems.	9(8.6%)	"I would rather research on my own" (Respondent 236) "Feel shy" (Respondent 113) "Coz they are kind of private and I feel uneasy" (Respondent 361)
Strength	Enduring Premenstrual pain without seeking any help or taking medication as a sign of strength.	2(1.9%)	"I'm a strong girl" (Respondent 365) "For weak people"

(Source: Primary Data, 2022)

These findings are in agreement with those carried out in other countries, as students report loss of concentration, class absenteeism, and not attending social gatherings/functions (Oo *et al.,* 2016; Shamnani *et al.,* 2018). Students also reported that the greatest effect of PMS was on their academic performance (Kalsoom *et al.,* 2018; Tolossa & Bekele, 2014). Of course, when you have poor concentration, sleep in class, and are late on assignments, it is going to affect your performance. You cease to be as efficient and effective compared to a student who is always alert, attentive, and present during all class lessons. At first, grades will drop, then later at the workplace, quality performance will be compromised. This kind of slacking can result in negligent errors that could cost someone's life depending on the profession, hence the need to find solutions.

Common PMS coping methods that have been documented include: Sleeping, resting, listening to music, self-medication (Molugulu *et al.,* 2016); use of traditional remedies/herbs (Shahbazi *et al.,* 2020); taking hot drinks; massage therapy (Tolossa & Bekele, 2014); and using nutritional supplements like fish oils or evening primrose oils (Molugulu *et al.,* 2016). These are not different from those reported to having being used in this study. However, the following are statistically significant with PMS symptoms, namely: taking alcohol, hiding or locking self in a room, crying, listening to music, seeing a health worker, or taking painkillers.

Although students hardly seek professional medical help when suffering from PMS (Durairaj & Ramamurthi, 2019; Molugulu *et al.,* 2016), respondents in this study population were more likely to seek medical help if they were suffering from PMS. The inefficiency and pain that comes with the PMS symptoms force many to try and seek solutions.

Different medications were used by the students in this study to relieve the PMS pain including vitamins and sleeping pills. Only the use of pain killers (analgesics) during the Luteal phase was significantly associated with PMS. This is similar to other studies where Analgesics and Non-Steroidal Anti-inflammatory drugs were used to relieve the PMS symptoms (Shahbazi *et al.,* 2020; Tolossa & Bekele, 2014). The commonly used analgesics used by students during PMS include Paracetamol, Mefenamic Acid, Ibuprofen, and Naproxen (Molugulu *et al.,* 2016); which are similar to those used by students in this study namely: Paracetamol, Ibuprofen, Pyroxicam, Mefenamic acid, and Diclofenac.

In this study population, Oral Contraceptives were not being used to manage PMS symptoms and neither was the use of contraceptives associated with PMS. Similarly in Ethiopia contraceptive use was not statistically significantly associated with PMS among students (Geta *et al.,* 2020). Some argue that Oral Contraceptive Pills (OCP) are used to manage PMS symptoms (Lydon *et al.,* 2020; Molugulu et al., 2016; Shahbazi et al., 2020); yet in other studies, users of OCP had an increased risk of developing PMS symptoms (Akoku *et al.,* 2020). This is an area of contention that needs to be investigated since contraceptive pills are hormonal, and the PMS determinants are also likely to be hormonal/biological. The way individuals react or respond to the contraceptive pills may be associated with their biology which is likely to vary from person to person.

Exercise though mentioned by some as a coping mechanism was not statistically significantly associated with PMS in this study population partly because of the pain, physical discomfort, and the fact that physical activity is decreased during the menstrual cycles (Lydon *et al.,* 2020).

The reasons why many students lock themselves in their rooms or hide is so that they avoid hurting other people due to the psychological symptoms of PMS like temper outbursts, mood swings, irritability, and depression among others. This is a way in which PMS sufferers protect their relationships from being affected.

Crying and tearfulness are one of the emotional/psychological symptoms of PMS. It is also a response to severe pain.

Listening to music and taking alcohol are distraction techniques to help one shift attention away from the pain.

6. Conclusions

PMS was significantly affecting school efficiency by causing students to sleep in class and turn in assignments late.

Statistically significant coping mechanisms among female university students in central Uganda included: hiding or locking themselves in a room, crying, listening to music, taking alcohol, seeing a health worker, and taking pain killers.

Recommendations

Faculty need to teach medical students about PMS and its significance so that they manage this condition as a priority instead of ignoring it simply because it does not kill. The fact that it reduces efficiency should be reason enough that PMS is taken seriously.

Educators need to be lenient, understanding, and accommodative with female students of reproductive age, especially if they suffer PMS. The condition decreases efficiency and concentration (one may seem unserious, or unfocused yet they can't help but sleep in class for example). If an educator notices a particular trend similar to PMS symptoms, they should encourage the students to seek medical attention for PMS – it is not to be mistaken for laziness, it is a real health condition.

There is still a huge knowledge gap, thus studies need to be carried out on the Knowledge, Attitudes, and Practices of PMS among the general population.

Some students reported that they used herbal preparations for PMS symptoms, these too need to further be investigated for potential pharmaceutical development.

School policies should be considerate of female students with regards to cutting back on restrictions and rules like elimination due to poor performance; instead, these girls can be educated about their health condition and given treatment so that they can equitably compete instead of being kicked out of school.

At workplaces, policies that advocate for the treatment of PMS instead of firing good employees for being irregular should be put in place.

7. Acknowledgement:

We wish to acknowledge the university students who took part in this study; and the administrators of Clarke International University, Kampala International University, Uganda Christian University, and Makerere University for providing a conducive environment and administrative clearance to carry out the study.

8. List of Abbreviations

ACOG American College of Obstetricians and Gynecologists
DHEA Dehydroepiandrosterone
DSM-IV Diagnostic and Statistical Manual of Mental Disorders (Fourth Edition)
IUD Intra-Uterine Device
PMS Premenstrual syndrome
PMDD Premenstrual Dysphoric Disorder
PSST Premenstrual Symptoms Screening Tool
NHCE National Council for Higher Education
OCP Oral Contraceptive Pills
SDA Seventh day Adventist
WFP World Food Programme
WHO World Health Organisation

9. Source of funding

This study was made possible by financial contributions from Mr. and Mrs Jorem Adutu (who are my parents).

10. Conflict of interest

The authors have no conflicts of interest in this study.

11. References:

1) Akoku, D. A., Vukugah, T. A., Tihnje, M. A., & Nzubepie, I. B. (2020). Oral contraceptive use and premenstrual syndrome among sexually active female students in Cameroon. The Pan African Medical Journal, 36, 333.https://doi.org

/10.11604/pamj.2020.36.333.25078PMid:33209157 PMCid:PMC7648490

2) American College of Obstetricians and Gynecologists. (2000). Clinical Management Guidelines for Obstetrician-Gynecologists: Premenstrual Syndrome. American College of Obstetricians and Gynecologists Practice Bulletin, 15, 1-9.

3) American Psychiatric Association. (2000). Diagnostic and Staistical Manual of Mental Disorders (Fourth Edition-Text Revision (DSM-IV-TR)). American Psychiatric Press.

4) Atim, E., Nabushawo, F., Ndagire, R., & Lwanira C. N. (2022). Prevalence and Severity of Premenstrual Syndrome among Female University Students in Central Uganda: A Cross sectional study. Student's Journal of Health Research Africa.

5) da Silva, E. A., & Pires, D. A. (2021). Prevalence of premenstrual syndrome and its psychological effects among university students who participate and do not participate in resistance training. Revista Brasileira de Ciências Do Esporte, 43.https://doi.org/10.1590/rbce.43.e007420

6) Daniel, W. (1999). Biostatistics: A foundation for Analysis in the Health Sciences.

7) Durairaj, A., & Ramamurthi, R. (2019). Prevalence, pattern and predictors of premenstrual syndrome (PMS) and premenstrual dysphoric disorder (PMDD) among college girls. The New Indian Journal of OBGYN, 5(2), 93-98.https://doi.org/10.21276/obgyn.2019.5.2.6

8) Eyob, A., Meron, M., Nahom, K., Filmon, W., Awet, T., Fisseha, S., & Furtuna, W. (2016). The Prevalence and Effects of Premenstrual Syndrome among Female Health Science Students in Eritrea. European Journal of Clinical and Biomedical Sciences, 2(1), 1-5.

9) Geta, T. G., Woldeamanuel, G. G., & Dassa, T. T. (2020). Prevalence and associated factors of premenstrual syndrome among women of the reproductive age group in Ethiopia: Systematic review and meta-analysis. PLoS ONE, 15(11), e0241702.https://doi.org/10.1371/journal.pone.0241702PMid:33156860 PMCid:PMC7647055

10) Hadija, W. J. (2013). Prevalence of premenstrual syndrome among nulliparous female medical students in Kampala International University-Western Campus [A research dissertation submitted to the Faculty of Clinical Medicine and Dentistry in partial fulfilment of the requirements for the award of Bachelor of Medicine and Bachelor of Surgery in Kampala International University]. Kampala International University.

11) Kalsoom, U., Sultan, A., Amjad, T., & Bairam, S. (2018). Prevalence of Premenstrual Synrome and Knowledge Assessment Regarding it's Prevention Among Medical Students of a Private Medical College of Islamabad. Pakistan Armed Forces Medical Journal, 68(1), 159-164.

12) Liu, Q., Wang, Y., van Heck, C. H., & Qiao, W. (2017). Stress reactivity and emotion in premenstrual syndrome. Neuropsychiatric Diseases and Treatment, 13, 1597-1602.https://doi.org/10.2147/NDT.S132001PMid:28670129 PMCid:PMC5481285

13) Lobo, R. A., & Pinkerton, J. (2010). Premenstrual Syndrome (PMS) and Premenstrual Dysphoric Disorder (PMDD). The Journal of Clinical Endocrinology Metabolism, 95(4).https://doi.org/10.1210/jcem.95.4.9998https://doi.org/10.1210/jcem.95.4.9999

14) Lydon, K., Madigan, S., & Rankin, A. (2020). The Prevalence and Burden of Pre-Menstrual Syndrome in the Athletic Population. British Journal of Sports Medicine, 54(Suppl 1), A100-A101.

15) Mohib, A., Zafar, A., Najam, A., Tanveer, H., & Rehman, R. (2018). Premenstrual Syndrome: Existence, Knowledge, and Attitude Among Female University Students in Karachi. Cureus, 10(3): e2290. doi:10.7759/cureus.2290https://doi.org/10.7759/cureus.2290

16) Molugulu, N., Tumkur, A., & Nilugal, K. C. (2016). Study of Premenstrual Syndrome among future Healthcare Professionals in Masterskill Global College. Intrnational Journal of Pharmacy and Pharmaceutical Sciences, 8(2), 66-71.

17) Naeimi, N. (2015). The Prevalence and Symptoms of Premenstrual Syndrome under Examination. Journal of Biosciences and Medicines, 3, 1-3.https://doi.org/10.4236/jbm.2015.31001

18) Nooh, A. M., Abdul-Hady, A., & El-Attar, N. (2016). Nature and Prevalence of Menstrual Disorders among Teenage Female Stu-

dents at Zagazig University, Zagazig, Egypt. Journal of Pediatric and Adolescent Gyecology, 29(2), 137-142.https://doi.org/10.1016/j.jpag.2015.08.008PMid:26343844

19) Oo, H. H., Sein, M. T., Mar, O., & Aung, A. (2016). Assessment of premenstrual syndrome among reproductive aged Myanmar women. Asian Journal of Medical Sciences, 7(4), 39-43.https://doi.org/10.3126/ajms.v7i4.13298

20) Quintana-Zinn, F. A., Whitcomb, B. W., Ronnenberg, A. G., Bigelow, C., Houghton, S. C., & Bertone-Johnson, E. R. (2017). Premenstrual symptom patterns and behavioral risk factors in young women: A cross-sectional study. Journal of Women's Health, 26(10), 1099-1105.https://doi.org/10.1089/jwh.2016.5921PMid:28650737

21) Shahbazi, F., Eslampanah, Z., & Niaparast, M. (2020). Prevalence of symptoms and medication use among female medical students and pharmacy clients with premenstrual syndrome: A cross-sectional study in Iran. Journal of Pharmacy Practice and Research, 50(1), 55-60.https://doi.org/10.1002/jppr.1609

22) Shamnani, G., Gupta, V., Jiwane, R., Singh, S., Tiwari, S., & Bhartiy, S. S. (2018). Prevalence of premenstrual syndrome and premenstrual dysphoric disorder among medical students and its impact on their academic and social performance. National Journal of Physiology, Phaarmacy and Pharmacology, 8(8), 1205-1208.https://doi.org/10.5455/njppp.2018.8.0415728042018

23) Steiner, M., Macdougall, M., & Brown, E. (2003). The premenstrual symptoms screening tool (PSST) for clinicians. Archives of Women's Mental Health, 2003(6), 203-209. https://doi.org/DOI 10.1007/s00737-003-0018-4https://doi.org/10.1007/s00737-003-0018-4PMid:12920618

24) Tolossa, F. W., & Bekele, M. L. (2014). Prevalence, impacts and medical management of premenstrual syndrome among femalee students: Cross-sectional study in college of health sciences, Mekelle University, Mekelle, Norther n Ethiopia. BMC Women's Health, 14(52), 1-9.https://doi.org/10.1186/1472-6874-14-52PMid:24678964 PMCid:PMC3994244

25) Victor, F. F., Souza, A. I., Barreiros, C. D. T., Barros, J. L. N. de, Silva, F. A. C. da, & Ferreira, A. L. C. G. (2019). Quality of life among university students with premenstrual syndrome. Revista Brasileira de Ginecologia e Obstetrícia, 41(5), 312-317.https://doi.org/10.1055/s-0039-1688709PMid:31181584

26) Yoshimi, K., Shiina, M., & Takeda, T. (2019). Lifestyle Factors Associated with Premenstrual Syndrome: A Cross-sectional Study of Japanese High School Students. Journal of Pediatric and Adolescent Gynecology, 32(6), 590-595.https://doi.org/10.1016/j.jpag.2019.09.001PMid:31518647

12. Publisher details:

Publisher: Student's Journal of Health Research (SJHR)
(ISSN 2709-9997) Online
Category: Non-Governmental & Non-profit Organization
Email: studentsjournal2020@gmail.com
WhatsApp: +256775434261
Location: Wisdom Centre, P.O.BOX. 148, Uganda, East Africa.