International Journal of Scientific Reports
Salman SK et al. Int J Sci Rep. 2024 Apr;10(4):95-101
http://www.sci-rep.com
pISSN 2454-2156 | eISSN 2454-2164
DOI: https://dx.doi.org/10.18203/issn.2454-2156.IntJSciRep20240713

Original Research Article

The prevalence of premenstrual syndrome symptoms and associated factors among female medical students at Al-Andalus University: a cross-sectional study

Safa K. Salman[1]*, Dina I. Esmandar[2], Enana K. Sarem[2], Ram F. Attaf[2]

[1]Department of Obstetrics and Gynecology, Al-Andalus University for Medical Sceinces, Al-Qadmus, Syria and Tishreen University, Latakia, Syria
[2]Faculty of Medicine, Al-Andalus University for Medical Sceinces, Al-Qadmus, Syria

Received: 01 February 2024
Accepted: 01 March 2024

***Correspondence:**
Dr. Safa K. Salman,
E-mail: ss8@au.edu.sy

Copyright: © the author(s), publisher and licensee Medip Academy. This is an open-access article distributed under the terms of the Creative Commons Attribution Non-Commercial License, which permits unrestricted non-commercial use, distribution, and reproduction in any medium, provided the original work is properly cited.

ABSTRACT

Background: Premenstrual syndrome (PMS) is a menstrual disorder defined as a cluster of various physical, emotional, and behavioural symptoms that negatively affect women's quality of life. This cross-sectional study aimed to assess the prevalence of common PMS symptoms and determine their association with body mass index (BMI), lifestyle, dietary habits, perceived stress, menstrual flow, family history and family income among medical students at Al-Andalus University in Syria.
Methods: A sample of 205 female students were interviewed and filled out a questionnaire. All data were coded and entered into excel (Microsoft 2019). One-way analysis of variance (ANOVA) and Chi-square tests were used to evaluate the association between PMS symptoms and the studied factors.
Results: The most frequently reported PMS symptoms were anxiety (80%), bloating (74.6%), and breast tenderness (62.9%). Our study found a significant association between weight gain pre-menstruation and BMI ($p=0.02$). A significant relationship was found between increased premenstrual consumption of sweets and both breast tenderness and bloating ($p=0.01$). Daily consumption of coffee was significantly correlated with weight gain and headaches ($p<0.001$). This study found a significant relationship between smoking cigarettes and abdominal and back pain ($p=0.04$, $p=0.02$, respectively). Smoking shisha was significantly associated with fatigue and bloating ($p=0.01$, $p<0.001$, respectively). A significant relationship was found between menstrual flow and both abdominal pain and headaches ($p=0.01$, $p=0.02$, respectively).
Conclusions: A high prevalence of PMS symptoms was reported in Al-Andalus University female medical students. Additionally, this study found multiple significant associations between BMI, dietary habits, lifestyle, menstrual flow and the severity of symptoms.

Keywords: Premenstrual syndrome, Dietary habits, Lifestyle, Anxiety, BMI

INTRODUCTION

Premenstrual syndrome (PMS) is a menstrual disorder defined as a cluster of various physical, emotional, and behavioural symptoms that occur during the last week of the luteal phase (usually the week that precedes menstruation).[1] The first to describe PMS was Frank, who coined the term "premenstrual tension" in 1931. In 1953, Greene and Dalton changed the term to "premenstrual syndrome" to describe both physical and psychological symptoms.[2] PMS includes over 100 symptoms; the most common symptoms are abdominal pain, headaches, fatigue, breast tenderness, bloating, anxiety, depression, and mood swings.[3]

The worldwide prevalence of PMS in females of reproductive age is approximately 75%. Furthermore,

multiple studies in the Arab World have shown a high prevalence of PMS among university students. For example, 63% in Lebanon, 71.9% in Palestine, 80.2% in Egypt, 92.3% in Jordan and 95% in the UAE.[4]

PMS has a serious impact on women's daily life.[5] Moreover, PMS negatively affects women's quality of life, as it decreases overall productivity, interferes with hobbies and increases the number of missed workdays for health reasons.[6] Additionally, it increases the risk of developing hypertension.[7] PMS negatively affects academic performance, as it lowers college attendance and concentration levels in class.[8,9] Remarkably, women in academic fields are reluctant to share that the cause of their absenteeism is a menstrual disorder.[10,11]

Previous studies have showcased a significant association between PMS and Body Mass Index (BMI), dietary habits, lifestyle, smoking and perceived stress.[12-14] Moreover, caffeine, tobacco and alcohol use increase the severity of PMS symptoms.[15] Most women use conservative treatments and lifestyle changes such as dietary modifications, stress management, exercise and certain herbal remedies to alleviate their symptoms.[3,16]

A noteworthy number of cases are underdiagnosed because women avoid reporting their symptoms to their healthcare providers, in addition to the difficulties related to gender bias that face doctors in diagnosing this syndrome.[17]

In Arab countries, topics surrounding menstruation and sexual health are considered taboo.[18] Cultural and religious beliefs heavily influence the way Syrian women perceive menstruation. They are often hesitant to discuss such topics in order to avoid societal "shame". This lack of awareness generates a myriad of misconceptions and raises the barrier between women and their healthcare providers.

Economic difficulties, such as unemployment and income decline, are associated with poor mental well-being.[19] This perceived stress increases the risk of PMS.[20] Women, among other groups, face high levels of stress in their daily lives due to the declining Syrian economy.

Despite the growing body of research in the Arab World, there is a noticeable gap in the literature concerning PMS in Syria. Thus, this study aims to assess the prevalence of common PMS symptoms and determine their association with BMI, lifestyle, dietary habits, perceived stress, menstrual flow, family history and family income among female medical students at Al-Andalus University.

METHODS

This cross-sectional study was conducted from 05 April 5 to 07 July 2022, and took place at Al-Andalus University for Medical Sciences.

At the time of the study, the total number of female students in the Faculty of Medicine was 360 students, 210 of whom agreed to participate in the study (58.33%).

Inclusion criteria were female students aged 18-24 years currently enrolled in the Faculty of Medicine at Al-Andalus University for Medical Sciences, and willing to participate in the study.

Exclusion criteria were students younger than 18 years old and older than 24 years old, students who suffer from systemic or immune diseases and those who have undergone recent pelvic surgery. Five students were excluded: Three students over the age of 24, one who had polycystic ovarian syndrome (PCOS) and one who had type one diabetes mellitus. The remaining 205 eligible students were interviewed.

After providing a thorough verbal explanation of the aim of the study and obtaining informed consent, each participant was interviewed by the researchers in the obstetrics and gynaecology clinic at Al-Andalus University Hospital. All participants were interviewed individually to ensure confidentiality, considering the sensitivity of the researched topic.

Each interview lasted for 10-15 minutes and included filling out a questionnaire developed by the researchers. Additionally, each participant's weight and height were measured. BMI was calculated by the formulation kg/m^2 and classified according to the World Health Organization (WHO) criteria.[21]

The questionnaire was conceptualized and developed by the researchers to fit the studied population. It was divided into four sections; the first asked about the participant's personal information (initials, age and age at menarche) and their previous knowledge of PMS. The second contained questions about the most common recurrent symptoms of PMS and asked the participant to rate the severity of each symptom (abdominal pain, back pain, headaches and fatigue) on a (0-10) scale. The rest of the second section's questions were yes/no questions, which asked about other symptoms (acne flare-ups, breast tenderness, bloating, weight gain, diarrhoea and constipation). The third section asked about dietary habits (consumption of sweet-tasting foods, meat, vegetables and caffeinated beverages) and lifestyle (physical exercise and smoking habits).

The final section consisted of questions regarding family history of PMS, perceived stress, family income, menstrual flow and the methods used to alleviate symptoms.

All data was reviewed, coded and entered into excel (Microsoft 2019). Chi-square and one-way ANOVA tests were used to evaluate the association between the studied factors and PMS symptoms. A p value that is less than 0.05 was considered significant.

RESULTS

The participants' ages ranged from 18 to 24 years and the mean age was 21.01±1.75 years. The mean age at menarche was 12.91±1.5 years. 137 (66.8%) of the participants had previous knowledge of PMS compared to 68 (33.2%) who did not.

It was found that 99% of the studied sample suffered from at least two recurrent PMS symptoms, 88% had five or more symptoms and 44% had at least eight recurrent PMS symptoms.

The mean BMI was 22.54±3.14 kg/m^2. According to the WHO BMI classification, 154 (75%) of the participants had a normal BMI, 17 (8%) were underweight, 29 (14%) were overweight, and 5 (2%) were obese.

115 (56%) of participants reported having a positive family history of PMS while 90 (44%) did not. Most of the studied samples 158 (77%) belonged to middle-income families, 6 (3%) belonged to low-income families and 41 (20%) belonged to high-income families. 158 (77%) of participants reported high levels of stress, compared to 47 (23%) who did not.

The prevalence of reported PMS symptoms was as follows: anxiety 164 (80%), bloating 151 (74.6%), breast tenderness 129 (62.9%), acne flare-ups 118 (57.8%) and weight gain 117 (57.1%). The reported severe physical symptoms were fatigue 74 (36.2%), abdominal pain 58 (28.2%), back pain 45 (21.9%) and headaches 22 (10.7%) (Table 1).

Overall, the most frequently reported psychological states were mood swings 25%, anger 24%, sadness 18%, anxiety 9%, and sensitivity 7%. On the other hand, 10% of the participants reported no changes in their psychological status.

The methods participants used to alleviate PMS symptoms were medications, such as paracetamol and non-steroidal anti-inflammatory drugs (NSAIDs) 35%, herbal drinks 31%, exercise 7% and other methods, such as heating pads and bed rest 4%. However, 47 23% of participants did not use any methods to alleviate their symptoms.

Dietary habits and lifestyles of the studied sample

The most frequently consumed foods before menstruation were sweets 85% followed by vegetables 52% and meat 45%.

26% of participants reported experiencing a lack of appetite pre-menstruation while 74% did not experience any changes in appetite.

58% of participants consumed Syrian coffee, 52% consumed tea and 49% consumed maté a herbal drink rich in caffeine. Pertaining to smoking habits, 11% smoked cigarettes and 39% smoked shisha.

Additionally, 39% of the participants reported practicing some kind of daily physical exercise.

Relationship between PMS symptoms and family income

No significant relationship was found between family income and the severity of PMS symptoms ($p>0.05$).

Relationship between PMS symptoms and BMI

BMI was significantly associated with weight gain. 76% of the overweight group suffered from weight gain, compared to 35% and 55% of the underweight and normal groups respectively ($p=0.02$).

There was a significant relationship between BMI and psychological symptoms such as anxiety. Moreover, 75% of participants with normal BMI suffered from anxiety compared to 94% and 93% of the underweight and overweight groups respectively ($p=0.02$).

No association was found between BMI and other PMS symptoms ($p>0.05$) (Table 2).

Table 1: Prevalence of premenstrual syndrome symptoms by the level of severity.

Physical symptoms	Mild n (%)	Moderate n (%)	Severe n (%)
Abdominal pain	104 (50.73)	43 (20.98)	58 (28.29)
Back pain	125 (60.98)	35 (17.07)	45 (21.95)
Headaches	166 (80.98)	17 (8.29)	22 (10.73)
Fatigue	93 (45.95)	37 (18.14)	74 (36.27)

Table 2: Relationship between BMI and physical symptoms.

Physical symptoms	BMI (%)			
	Underweight	Normal	Overweight	P value
Abdominal pain				
Mild	24	27	24	
Moderate	35	34	38	0.006
Severe	41	40	38	

Continued.

Physical symptoms	BMI (%)			
	Underweight	Normal	Overweight	P value
Back pain				
Mild	18	32	31	0.209
Moderate	47	40	31	
Severe	35	28	38	
Headache				
Mild	71	69	45	0.172
Moderate	12	17	34	
Severe	18	14	21	
Fatigue				
Mild	24	28	17	0.848
Moderate	29	25	38	
Severe	47	47	45	
Breast tender-ness				
Yes	47	63	72	0.230
No	53	37	28	
Bloating				
Yes	65	74	90	0.112
No	35	26	10	
Weight gain				
Yes	35	55	76	0.020
No	65	45	24	
Acne flare-ups				
Yes	59	56	69	0.424
No	41	44	31	
Anxiety				
Yes	94	75	93	0.027
No	6	25	7	
Diarrhea				
Yes	18	24	14	0.435
No	82	76	86	
Constipation				
Yes	18	19	7	0.294
No	82	81	93	

Relationship between PMS symptoms and dietary habits

The study found a significant relationship between breast tenderness and eating sweets (p=0.01). Moreover, participants who have a habit of consuming sweet-tasting foods before menstruation reported higher levels of breast tenderness 65% compared to participants who do not 52%. Similarly, bloating was significantly associated with eating sweets (p=0.01), as participants who regularly consume sweet-tasting foods before menstruation reported higher levels of bloating 78% compared to those who did not 58%. However, no statistically significant association was found between the consumption of vegetables or meat and PMS symptoms (p>0.05).

A significant association between the daily consumption of coffee and an increase in certain physical symptoms was found. Participants who drink coffee daily were more likely to suffer from severe headaches 18% and weight gain 64% than those who do not drink coffee daily (10% and 46%, respectively, p<0.001). In contrast, participants who drink coffee daily were less likely to suffer from severe fatigue 40% than those who do not (56%, p=0.04).

Several symptoms including abdominal pain, weight gain and diarrhoea were found in participants who reported daily consumption of maté (p=0.01, p=0.03, and p=0.01, respectively). Participants who drink maté daily were less likely to suffer from severe abdominal pain 36%, weight gain 50% and diarrhoea 9% compared to those who do not (56%, 64%, and 21%, respectively). No significant relationship was found between the daily consumption of tea and PMS symptoms (p>0.05).

Relationship between PMS symptoms and lifestyle

Smoking cigarettes was significantly associated with decreased levels of reported abdominal and back pain (p=0.004, and p=0.02, respectively). Participants who smoke cigarettes daily were less likely to suffer from severe abdominal pain 17% and severe back pain 8%

compared to those who do not smoke cigarettes (43% and 34%, respectively).

The study found that symptoms such as fatigue and bloating were less severe in students who smoke shisha daily (p=0.01, p<0.001, respectively). Participants who smoke Shisha daily were less likely to suffer from severe fatigue 40% and bloating 49% than those who do not smoke Shisha daily (50% and 64% respectively). There was no association between daily physical exercise and PMS symptoms (p>0.05).

Relationship between PMS symptoms and family history

The study found no association between family history and PMS symptoms (p>0.05).

Relationship between PMS symptoms and menstrual flow

The menstrual flow was significantly associated with abdominal pain and headaches (p<0.05). Moreover, participants who had heavy menstrual flow were more likely to suffer from severe abdominal pain 62% than those who had light 25% and moderate 37% menstrual bleeding. Similarly, participants who had heavy menstrual flow were more likely to suffer from severe headaches 27% than those who had light 4% and moderate 14% menstrual flow (p<0.05).

Relationship between PMS symptoms and perceived stress

The study found no relationship between perceived stress and PMS symptoms (p>0.05).

DISCUSSION

This study aimed to evaluate the prevalence of common PMS symptoms and determine their association with BMI, lifestyle, dietary habits, perceived stress, menstrual flow and family history among female medical students at Al-Andalus University.

According to the available literature, this is the first study to examine the prevalence of PMS symptoms and their correlation with lifestyle and dietary habits in Syria.

The mean age at menarche was 12.91±1.5 years. This is in line with another study by Salman et al which reported that the mean age at menarche was 13.38±1.35 years among Al-Andalus University female students.[22]

This study found that 99% of the studied participants suffered from at least two recurrent PMS symptoms, 88% experienced five or more symptoms and 44% had at least eight recurrent PMS symptoms. Similarly, previous studies found that 100% of Palestinian women and 99% of Saudi women suffered from some type of PMS symptoms.[4,23]

The current study found no association between the family income of participants and the severity of PMS symptoms, which is similar to the results of Abu Alwafa et al who found no significant relationship between socio-demographic characteristics and PMS symptoms.[4] This contradicts the result of a Jordanian study that observed a higher prevalence of PMS among women with low incomes than those who have high incomes.[24] This inconsistency could be explained by the differences in the studied samples, as most of our participants belong to middle or high-income families.

The study found an association between BMI and PMS symptoms, such as weight gain. Similarly, Bertone-Johnson et al found that overweight women had a higher risk of suffering from PMS symptoms.[13] Additionally, a significant correlation was found between BMI and the severity of PMS symptoms in Jordanian women.[24] Alternatively, several studies found no association between the BMI of participants and the reported PMS symptoms.[4,25] This variation in results could be due to differences in countries' circumstances.

The increased consumption of sweets pre-menstruation was significantly associated with certain PMS symptoms, such as bloating and weight gain. Many women experience a change in their dietary habits before menstruation, preferring the consumption of chocolates and sweets.[26] The findings are consistent with several other studies that noted a significant relationship between sugar intake and both physical and psychological PMS symptoms.[15,26]

The current study found an association between daily caffeine intake and certain PMS symptoms, such as headaches, fatigue and weight gain. However, other studies did not establish an association between caffeine intake and PMS symptoms.[26,27] Some women may self-medicate their PMS symptoms, such as fatigue, with caffeine, which exacerbates other symptoms.[28] While it is plausible to establish an association between caffeine intake and PMS symptoms, more studies are needed to determine whether caffeine consumption is a cause or a response to PMS symptoms.

The current study found that smoking cigarettes was associated with decreased severity of abdominal and back pain. This is in contrast to the findings of Hashim et al who suggested that smokers have a higher risk of reporting more severe PMS symptoms than non-smokers.[26] Moreover, another study reported an increased risk of moderate to severe PMS symptoms in women who started smoking in adolescence. However, it is unknown whether smoking is directly associated with the aetiology of PMS or whether women who suffer from PMS smoke to alleviate their symptoms.[13] Therefore, additional research is needed to better understand the associations between smoking and the development of PMS symptoms.

The current study found no significant association between daily physical exercise and PMS symptoms, which is

consistent with the results of Hashim et al.[26] Contrary to AlQuaiz et al who found a significant association between low physical exercise and breast pain.[29]

Participants who suffered from heavy menstrual bleeding had a higher prevalence of certain reported symptoms, such as abdominal pain and headaches. This is in line with Kamat et al who reported that menorrhagia was related to PMS.[30]

The most common ways participants used to alleviate their symptoms were medication (such as paracetamol and NSAIDs) and drinking herbal tea. Similarly, Hamaideh et al reported that self-treatment measures such as taking analgesics, drinking hot beverages, and lying on the abdomen were commonly used.[24]

CONCLUSION

The most frequently reported PMS symptoms were anxiety, bloating and breast tenderness. The most common severe physical symptoms were fatigue and abdominal pain. The study found a significant association between certain PMS symptoms and BMI, increased consumption of sweets, daily consumption of coffee and maté, smoking cigarettes and shisha and menstrual flow. No significant association was found between PMS symptoms and family income, consumption of vegetables and meat, daily consumption of tea, physical exercise, family history or perceived stress. The high prevalence of reported PMS symptoms generates a need for better detection and diagnostic methods, which will help reluctant students in seeking medical advice, especially considering that approximately a third of participants had no previous knowledge of PMS. The overall findings of this research can be implemented in developing educational programs tailored to raising awareness of the factors that affect PMS symptoms. Further research is needed to find direct cause/effect relationships to determine preventative factors.

ACKNOWLEDGEMENTS

Authors would like to thank the female undergraduate medical students who agreed to participate in this study. Additionally, they would like to express their gratitude to Mrs. Francis Doughman for proof-reading the manuscript.

Funding: No funding sources
Conflict of interest: None declared
Ethical approval: The study was approved by the Institutional Ethics Committee

REFERENCES

1. Begum M, Das S, Sharma HK. Menstrual disorders: causes and natural remedies. J Pharm Chem Biol Sci. 2016;4(2):307-20.
2. Richardson JT. The premenstrual syndrome: a brief history. Soc Sci Med. 1995;41(6):761-7.
3. Steiner M. Premenstrual syndrome and premenstrual dysphoric disorder: guidelines for management. J Psychiatry Neurosci. 2000;25(5):459-68.
4. Abu Alwafa R, Badrasawi M, Haj Hamad R. Prevalence of premenstrual syndrome and its association with psychosocial and lifestyle variables: a cross-sectional study from Palestine. BMC Women's Health. 2021;21(1):233.
5. Dennerstein L, Lehert P, Bäckström TC, Heinemann K. The effect of premenstrual symptoms on activities of daily life. Fertil Steril. 2010;94(3):1059-64.
6. Borenstein JE, Dean BB, Endicott J, Wong J, Brown C, Dickerson V, et al. Health and economic impact of the premenstrual syndrome. J Reprod Med. 2003;48(7):515-24.
7. Bertone-Johnson ER, Whitcomb BW, Rich-Edwards JW, Hankinson SE, Manson JE. Premenstrual Syndrome and Subsequent Risk of Hypertension in a Prospective Study. Am J Epidemiol. 2015;182(12):1000-9.
8. Tolossa FW, Bekele ML. Prevalence, impacts and medical managements of premenstrual syndrome among female students: cross-sectional study in College of Health Sciences, Mekelle University, Mekelle, northern Ethiopia. BMC Womens Health. 2014;14:52.
9. Balaha MH, Amr MA, Saleh Al Moghannum M, Saab Al Muhaidab N. The phenomenology of premenstrual syndrome in female medical students: a cross sectional study. Pan Afr Med J. 2010;5:4.
10. Ballagh SA, Heyl A. Communicating with women about menstrual cycle symptoms. J Reprod Med. 2008;53(11):837-46.
11. Greene R, Stratton P, Cleary SD, Ballweg ML, Sinaii N. Diagnostic experience among 4,334 women reporting surgically diagnosed endometriosis. Fertil Steril. 2009;91(1):32-9.
12. Rad M, Sabzevary MT, Dehnavi ZM. Factors associated with premenstrual syndrome in Female High School Students. J Educ Health Promot. 2018;7:64.
13. Bertone-Johnson ER, Hankinson SE, Johnson SR, Manson JE. Cigarette smoking and the development of premenstrual syndrome. Am J Epidemiol. 2008;168(8):938-45.
14. Rasheed P, Al-Sowielem LS. Prevalence and predictors of premenstrual syndrome among college-aged women in Saudi Arabia. Ann Saudi Med. 2003;23(6):381-7.
15. Polak K, Nora P, Perry B. Licit Substance Use and Premenstrual Syndrome Symptom Severity in Female College Students. Womens Health Rep (New Rochelle). 2022;3(1):443-9.
16. Verma RK, Chellappan DK, Pandey AK. Review on treatment of premenstrual syndrome: from conventional to alternative approach. J Basic Clin Physiol Pharmacol. 2014;12.
17. Futterman LA, Rapkin AJ. Diagnosis of premenstrual disorders. J Reprod Med. 2006;51(4):349-58.

18. DeJong J, Jawad R, Mortagy I, Shepard B. The sexual and reproductive health of young people in the Arab countries and Iran. Reprod Health Matters. 2005;13(25):49-59.
19. Frasquilho D, Matos MG, Salonna F, Guerreiro D, Storti CC, Gaspar T, et al. Mental health outcomes in times of economic recession: a systematic literature review. BMC Public Health. 2016;16:115.
20. Del Mar Fernández M, Regueira-Méndez C, Takkouche B. Psychological factors and premenstrual syndrome: A Spanish case-control study. PLoS One. 2019;14(3):e0212557.
21. Weir CB, Jan A. BMI Classification Percentile And Cut Off Points. In: StatPearls. Treasure Island (FL): StatPearls Publishing. 2022.
22. Salman SK, Mohammad MH, Mhanna AY, Saleh SY. The affected factors of puberty and menstrual disturbances among female students at Al-Andalus university. Int J Sci Rep. 2020;6:500-7.
23. Algahtani HM, Jahrami HA. The Experience and Severity of Premenstrual Syndrome among a Saudi Sample using a newly Developed Arabic Language Scale. Arab J Psychiatry. 2014;25(1):33-9.
24. Hamaideh SH, Al-Ashram SA, Al-Modallal H. Premenstrual syndrome and premenstrual dysphoric disorder among Jordanian women. J Psychiatr Ment Health Nurs. 2014;21(1):60-8.
25. Mizgier M, Jarzabek-Bielecka G, Jakubek E, Kedzia W. The relationship between body mass index, body composition and premenstrual syndrome prevalence in girls. Ginekol Pol. 2019;90(5):256-61.
26. Hashim MS, Obaideen AA, Jahrami HA, Radwan H, Hamad HJ, Owais AA, et al. Premenstrual syndrome is associated with dietary and lifestyle behaviours among university students: a cross-sectional study from Sharjah, UAE. Nutrients. 2019;11(1939):1-18.
27. Purdue-Smithe AC, Manson JE, Hankinson SE, Bertone-Johnson ER. A prospective study of caffeine and coffee intake and premenstrual syndrome. Am J Clin Nutr. 2016;104(2):499-507.
28. Rossignol AM, Bonnlander H, Song L, Phillis JW. Do women with premenstrual symptoms self-medicate with caffeine? Epidemiology. 1991;2(6):403-8.
29. AlQuaiz A, Albugami M, Kazi A, Alshobaili F, Habib F, Gold EB. Dietary, Psychological and Lifestyle Factors Associated with Premenstrual Symptoms. Int J Womens Health. 2022;14:1709-22.
30. Kamat SV, Nimbalkar A, Phatak AG, Nimbalkar SM. Premenstrual syndrome in Anand District, Gujarat: A cross-sectional survey. J Family Med Prim Care. 2019;8(2):640-7.

Cite this article as: Salman SK, Esmandar DI, Sarem EK, Attaf RF. The prevalence of premenstrual syndrome symptoms and associated factors among female medical students at Al-Andalus University: a cross-sectional study. Int J Sci Rep 2024;10(4):95-101.