Quarterly Journal Fides et Ratio
Issue 3(55)2023, ISSN 2082-7067, Pages 27-40

Premenstrual syndrome symptoms in women of reproductive age – a preliminary report[1]

https://doi.org/10.34766/fetr.v55i3.1204

Agnieszka Bałanda-Bałdyga[a], Klaudia Pałucka[b], Jagoda Niedźwiedź[c], Jan J. Kęsik[d], Anna B. Pilewska-Kozak[e]

[a] *Agnieszka Bałanda-Bałdyga, MSc, PhD, https://orcid.org/0000-0001-5351-8063,*
Cardinal Stefan Wyszyński University in Warsaw, Faculty of Medical Science, Department of Integrated Medical Care
[b] *Klaudia Pałucka, MSc, PhD, https://orcid.org/0000-0002-6467-9118,*
Independent Public Health Care Facility in Turek
[c] *Jagoda Niedźwiedź, MSc, https://orcid.org/0009-0009-3116-7114*
A graduate of Midwifery, Faculty of Health Sciences, Medical University of Lublin
[d] *Jan Jakub Kęsik, MD, PhD, https://orcid.org/0000-0002-9865-1463,*
Chair and Department of Vascular Surgery and Angiology, Faculty of Medicine, Medical University of Lublin
[e] *Associate Prof. Anna B. Pilewska-Kozak, PhD, https://orcid.org/0000-0003-4562-2295,*
Department of Obstetrics and Gynaecology Nursing, Chair of Obstetrics and Gynaecology, Medical University of Lublin

Abstract: At least one or more psychosomatic symptoms, characteristic of premenstrual syndrome (PMS) or premenstrual dysphoric disorder (PMDD) occur in the vast majority of women prior to the menstrual bleeding. *Aim of the study:* The objective of the work was to investigate whether and to what extent PMS symptoms occur in women of reproductive age as well as what the symptoms depend on. *Material and Methods:* The research was conducted from February to June 2019 among 252 reproductive-age women aged 20-35 years old at the Medical University of Lublin, University of Life Sciences in Lublin and Obstetric-Gynaecological Outpatient Clinic in Świdnik, Poland. In the work the survey diagnostic method was applied along with the use of the authors' own questionnaire and Premenstrual Syndrome Scale (PMSS). *Results:* In nearly a half of the respondents (45.2%) intensity of symptoms was found at the moderate level. In turn, a total of 40.5% of the respondents experienced no symptoms of PMS (0.4%) or mild ones (40.1%). The category of the most frequent symptoms encompassed physical symptoms namely breast tenderness and swelling (52.8%), skin lesions (44%), food cravings for salt and sugar (40.9%). The level of education of the respondents differentiated experiencing of PMS symptoms ($p = 0.001$). Intensity of PMS symptoms was not dependent on age ($p = 0.097$), physical activity ($p = 0.054$), dietary habits ($p = 0.650$) and taking vitamin D ($p = 0.159$) and vitamin B ($p = 0.458$). *Conclusions:* The vast majority of the women experience at least one of PMS symptoms. Nearly a half of them suffer from PMS syndrome at the moderate level. Physical symptoms are found among the most common PMS symptoms, in particular breast tenderness and swelling, skin lesions and food cravings. The category of psychological symptoms encompassed mainly irritability, mood swings, tension, lack of concentration, crying spells and anxiety. Behavioural symptoms are the most rare ones; the women report the following as the most common symptoms being over sensitive, impaired work performance, lack of interest in usual activities, social withdrawal and restlessness. The results obtained indicate the necessity of further investigations in the subject area referring to women of different age groups, different health status, level of education and having different health behaviours.
Keywords: menstrual cycle, premenstrual syndrome, premenstrual dysphoric disorder

Introduction

Currently an increasingly greater attention is drawn to an influence of premenstrual period on the quality of life in women as well as wellbeing of their families and the entire community. During the menstrual cycle, concentration of hormones change. Symptoms that occur in women are strictly time-related to menstrual cycle. The symptoms become noticeable

1 Article in polish language: Objawy zespołu napięcia przedmiesiączkowego u kobiet w wieku rozrodczym – badania wstępne https://www.stowarzyszeniefidesetratio.pl/fer/2023-3Palu.pdf

in the luteal phase and symptoms remission follows the start of menstrual bleeding (Itriyeva, 2022; Khalida, 2022).

The International Society of Premenstrual Disorders (ISPMD) that consists of a multidisciplinary team of experts, distinguished two main disorders regarding premenstrual problems. They include premenstrual syndrome (PMS) and premenstrual dysphoric disorder (PMDD) (Itriyeva, 2022; Khalida, 2022).

PMS constitutes a group of somatic symptoms, psychological and behavioural associated with the second phase of the cycle. Symptoms of the syndrome begin in the luteal phase, usually around ten days prior to the menses and finish in the first days of the period or at the end of the period. It concerns solely women of reproductive age, namely those who have ovulation cycles. Worldwide a total of 47.8% of reproductive age women suffer from PMS. Approximately 20% of them experience so severe symptoms that they interfere their daily functioning, the rest have mild to moderate symptoms (Frey Nascimento, Gaab, Kirsch, Kossowsky, Meyer, Locher, 2020). Other authors report that PMS prevalence oscillates even in the range of 50–85% (Ryu, Kim, 2015). Lack of diagnostic consensus and differences in symptoms interpretation aimed at the determination of the syndrome along with differences in the populations researched, contribute to a vast inconsistency in determining epidemiology of the phenomenon (Rezende, Alvarenga, Ramos, Franken, Costa, Pattussi, Paniz, 2022).

Although different hypotheses have been formulated, the aetiology of PMS and PMDD is not fully known. Females with PMS are recognized to have inappropriate response to physiologically fluctuating ovarian hormones. The current scientific evidence shows that premenstrual disorders are brought on by the interaction between cyclic changes in ovarian steroids and functioning of neurotransmitters. One of the most frequently researched neurotransmitter in the pathogenesis of PMS is serotonin. Serotonin insufficiency and increased sensitivity to progesterone can also be responsible for the disorder. The occurrence and increase in severity of PMS symptoms can be caused by neurohormonal and genetic factors that are still researched along with mineral and vitamin deficiency, and unhealthy lifestyle (Pokharel, Rana, Moutchia, Uchai, Kerri, Gutiérrez, Islam, 2020).

PMS symptomatology is considerably vast and different for each individual. Differences in experiencing PMS symptoms can result from cultural differences, socioeconomic status, lifestyle, individual attitudes, work overload and family duties. A total of 200 psychosomatic symptoms have been distinguished that can be manifested in the luteal phase of the cycle. Most females experience at least one of them (Nappi, Cucinella, Bosoni, Righi, Battista, Molinaro, Stincardini, Piccinino, Rossini, Tiranini, 2022; Siminiuc,Țurcanu, 2023).

The American College of Obstetricians and Gynaecologists (ACOG) developed the diagnostic criteria of PMS. The diagnosis of PMS requires the occurrence of at least one of the four somatic symptoms and one of the six psychological symptoms. The symptoms need to occur at least 5 days prior to menstruation and subside to the fourth day following the beginning of menstrual bleeding. PMS symptoms cannot occur in the pre-ovulation phase, which means that the symptoms should not occur before the 13th day of the menstrual cycle. Assessment needs to be done in the three previous menstrual cycles – retrospective assessment, alternatively during the two consecutive cycles – prospective assessment. While filling in the observations diary, pharmacotherapy cannot be used along with hormone administration, alcohol, drugs and psychoactive substances. The diagnostic symptoms of the somatic group include abdominal bloating, breast tension, oedematous extremities and headache. Psychological symptoms encompass anger, irritation, depression, concerns, anxiety, social withdrawal (Molugulu, Tumkur, Nilugal, 2016).

PMDD is characterised by cyclic relapse of psychological symptoms including irritability, nervousness/restlessness, stimulation, anger, insomnia, poor concentration, severe fatigue, depression, anxiety and disorientation. The disorder considerably impairs women's performance and therapy is required. The prevalence of PMDD fluctuates between 3 and 8% of all menstruating women (Osborn, Wittkowski, Brooks, Briggs, ShaughnO'Brien, *2020*). Other authors report that PMDD occurs in 3-5% females, and while making a detailed diagnosis the percentage is reduced to 2% of the population of females of reproductive age (American Psychiatric Association, 2013; Śliwerski, Koszałkowska,2021).

PMDD is manifested by more severe symptoms than PMS, in particular in psychosocial sphere. The American Psychiatric Association (APA) determined diagnostic criteria according to the Diagnostic and Statistical Manual of Mental Disorder – fourth edition (DSM – IV). In 2019 the World Health Organisation (WHO) announced the inclusion of PMDD in the International Classification of Diseases and Related Health Problems 11th Revision (ICD-11) as genitourinary diseases. The classifications of PMDD, both as a mental condition in DSM-5 and as a morbidity in ICD-11 demonstrate the complexity of differentiation of factors of both physical and mental health because healthcare systems are still traditionally divided into treatment of medical issues and mental ones (Osborn et al., 2020). To make a diagnosis of PMDD, symptoms need to occur in the luteal phase in most cycles within the last year and need to encompass somatic symptoms, in particular affective ones. Furthermore, the condition needs to cause considerable worsening of quality of life (Schroll, Lauritsen, 2022). The issue of premenstrual disorders is common and is associated with cyclic experiencing of a lot of oppressive psychophysical symptoms by females. This can reasonably impair their quality of life both in their private life and professional development. Wellbeing of women and their daily performance also affects indirectly their families and the entire communities they live with. Therefore, investigating the issue is of great significance and aimed at improvement of care of the group of females (Nappi et al., 2022; Siminiuc, Țurcanu, 2023).

1. Own research

1.1. The aim of the work

The objective of the study was to investigate whether and to what extent severity of premenstrual symptoms occur in women of reproductive age and what they depend on.

1.2. Material and Methods

The diagnostic survey method was applied in the work. A technique of questionnaire of reproductive-age women was used to collect date. The research instrument utilized was the authors' own questionnaire compiled specially for the study and Premenstrual Syndrome Scale (PMSS).

The study was carried out from February to June 2019 among 252 females. The paper questionnaires were provided for the women to fill them in at the Medical University of Lublin, University of Life Sciences in Lublin and Obstetric-Gynaecological Outpatient Clinic in Świdnik, Poland. In the study, purposive sampling was applied and the inclusion criteria were as follows reproductive age women, aged 20-35 years old. The participation in the research was voluntary following the provision of the consent according to the Helsinki Declaration.

The research material was collected due to the authors' own questionnaire and Premenstrual Syndrome Scale (PMSS) taken from the publication by P. Padmavathi, R. Sankar, N. Kokilavani, K. Dhanapal, B. Ashok entitled *Validity and Reliability Study of Premenstrual Syndrome Scale (PMSS)* after getting the authors permission (Padmavathi et al. 2014).

The questionnaire consisted of 28 questions concerning sociodemographic factors like place of residence, age, marital status and education. They regarded the females' lifestyle, a type of diet, sexual and physical activity, taking stimulants and diet supplements or medicines. The questionnaire also contained a brief ob-gyn interview: age of menarche, duration of periods and menstrual cycles, number of pregnancies, deliveries and complications of pregnancy.

The PMSS contains 40 most common symptoms of PMS divided into 3 groups, namely physical (somatic), psychological (emotional) and behavioural ones. The physical symptoms include 16 ones such as breast tenderness and swelling, abdominal bloating, weight gain, headache, dizziness/fainting, fatigue, palpitations, pelvic discomfort and pain, abdominal cramps, change in bowel habits, increased appetite, generalized aches and pains, food cravings (for sugar, salt), skin changes, rashes/pimples, nausea/vomiting, muscle and joint pains. The 12 emotional symptoms are as follows irritability, anxiety, tension, mood swings, loss of concentration,

depression, forgetfulness, crying spells, sleep changes – hypersomnia or insomnia, confusion, aggression and hopelessness. In turn, the behavioural symptoms include the following 12 ones: social withdrawal, restlessness, lack of self-control, feeling guilty, clumsiness, lack of interest in usual activities, poor judgement, impaired work performance, obsessional thoughts, compulsive behaviours, irrational thoughts and being over sensitive.

A respondent attributes each PMS symptom a number of points depending on the experienced intensity during the last menstrual cycle. The scale ranges from 1 to 5 where 1 means never, 2 – rarely, 3 – sometimes, 4 – very often, 5 – always. The maximum possible score is 200 points while the minimum 40 points. Each symptom is multiplied by its severity and all the symptoms are added. The scale allows for classification of severity of PMS symptoms into 5 groups: no symptoms, mild symptoms, moderate, severe and very severe ones.

The respondents were provided with the questionnaire along with the informed consent form to participate in the study that included information about the aim of the research performed, anonymity and the use of the data collected solely for scientific purposes.

The research material obtained was subjected to descriptive and statistical elaboration. The variables measured on the nominal scale were characterized by numbers and percentage of the values given. However, the variables measured on the quotient scale were described using mean, standard deviation, median, minimum and maximum values of the phenomenon researched.

Dependence between categorial qualitative variables was checked using the Chi-square test of independence. The results of the analysis were assumed to be statistically significant at the significance level of $p<0.05$.

2. Results

2.1. Characteristics the research group

The mean age of the females researched was 26.76 years old while median was 26 years old. The youngest woman was 20 years old and the oldest was 35. Almost a half of the women researched (46.8%; N = 118) was aged 20-25 years old, a total of 27% of the women (N = 68) were in the age range of 31-35 years old, and 26.2% (N = 66) were aged 26-30 years old.

More than a half of the respondents (66.3%; N = 167) were inhabitants of urban areas and the rest 33.7% (N = 85) of rural ones. A total of 60.7% of the women (N = 153) had higher education, 32.0% (N = 78) secondary and 6.3% (N = 16) vocational, the fewest women 2% (N = 5) had primary education. More than a half of the females (55.6%; N = 140) were single while the rest 44.4% (N = 112) were married.

2.2. Data on the ob-gyn interview

The mean age of menarche was 12.95 years old while median was 13 years old. The lowest age of menarche was 8 years old and the highest was 17 years old. Most of the females admitted that menarche occurred when they were under 13 years old (38.9%; N = 98). A total of 29.4% (N = 74) had menarche at the age of 13 years old and 31.7% (N = 80) at the age 13 plus years old. A total 81% of the women researched (N = 204) had regular menstrual cycles while 19% (N = 48) of the respondents had irregular cycles. More than a half of the respondents (61.9%; N = 156) did not have offspring while the rest of 38.1% (N = 96) had at least one child.

2.3. Data on factors that can affect PMS symptoms

Physical activity level of the women researched was assessed and it was as follows: most of them were physically active (72.2%; N = 182) and the rest of the women (27.8%; N = 70) were not physically active. Most of the females (46.4%; N = 117) were physically active once or twice a week, 21.0% of the respondents were active three or four times a week and 4.8% (N = 12) of the women were active five and more times a week.

The vast majority of the females (69.8%; N = 176) did not use any stimulants. At least one stimulant was used by 30.2% (N = 76) of the women. The vast majority of the respondents (76.3%; N = 58) used alcohol.

The vast majority of the respondents (83.3%; N = 210) were sexually active. Slightly more than a half of the females (54.8%; N = 138) did not use any contraceptives. The most common method used was condoms by 34.9% (N = 88), considerably fewer women (10.3%; N = 26) used hormonal contraceptives.

More than a half of the respondents (56.6%; N = 141) slept 5-7 hours a night. Every third woman slept 7-9 hours (32.1%; N = 81) while a total of 11.1% (N = 28) of the women slept 3-4 hours a night. Two women (0.8%) slept more than 9 hours a night.

The vast majority of the respondents ((0.5%; N = 228) were on a general diet. A small percentage of the females had special diets. Slightly more than a half of the females (56.0%; N = 141) did not take vitamin D whereas 44.0% (n = 111) of them took it. More than a half of the women (60.7%; N = 153) did not take vitamin B while a total of 39.3% (N = 99) of the respondents took it.

The vast majority of the women (96.0%; N = 242) had never been treated for premenstrual disorders while a total of 4.0% (N = 10) used drugs to cope with increased PMS and PMDD symptoms. Table 1 shows data on medicines taken by the women researched. The most common drugs taken were hormonal contraceptives by 11.1% (N = 28) of the females. Whereas a total of 2.68% (N = 17) of the women used other pharmaceuticals (SSRI, GnRH and other) to reduce PMS symptoms.

2.4. Severity of PMS symptoms

Table 2 demonstrates the level of intensity of symptoms in the women researched based on the PMSS.

Every woman had the level of intensity of typical PMS symptoms assessed using the PMSS. A total of 40.5% (N = 102) of the respondents had mild symptoms including one woman (0.4%) who did not have any symptoms. Moderate level of

Table 1. Drugs taken to decrease symptoms of PMDD by the women researched

Drugs	n	%**
SSRIs	5	1.98
hormonal	28	11.11
GnRH agonists	1	0.40
other	13	0.31
Total	47*	-

* number of responses; **n = 252, i.e. 100 %

Table 2. Level of PMS symptoms in the women researched

Level of PMS symptoms	N	%	Highly/ poorly intensified
No symptoms	1	0.4	40.5
Mild	101	40.1	
Moderate	114	45.2	45.2
Severe	31	12.3	14.3
Very severe	5	2.0	
Total	252	-	-

Table 3. Values of coefficients for the sum of intensity of PMS symptoms in all the group

	M	SD	Min	Max	Q1	Me	Q3
Sum of intensity of physical PMS symptoms (16–80)	41.35	11.24	16.00	72.00	33.00	41.00	50.00
Sum of intensity of mental PMS symptoms (12–60)	28.73	10.45	12.00	60.00	21.00	27.00	35.00
Sum of intensity of behavioral PMS symptoms (12–60)	20.73	9.52	12.00	60.00	13.00	18.00	25.00

*assessed in 5-point Likert scale

Table 4. Dependence between the level of intensity of symptoms due to different factors

Age	No symptoms/ mild symptoms	Moderate symptoms	Severe/ very severe symptoms	Total
20-25 years old	42	57	19	118
	35.6%	48.3%	16.1%	100.0%
26-30 years old	23	34	9	66
	34.8%	51.5%	13.6%	100.0%
31-35 years old	37	23	8	68
	54.4%	33.8%	11.8%	100.0%
Total	102	114	36	252
	40.5%	45.2%	14.3%	100.0%
Chi-square = 7.847; p = 0.097				
Education	No symptoms/ mild symptoms	Moderate symptoms	Severe/ very severe symptoms	Total
Primary/ post-primary/ Vocational	13	1	7	21
	61.9%	4.8%	33.3%	100.0%
Secondary	24	42	12	78
	30.8%	53.8%	15.4%	100.0%
Higher	65	71	17	153
	42.5%	46.4%	11.1%	100.0%
Total	102	114	36	252
	40.5%	45.2%	14.3%	100.0%
Chi-square = 19.758; p = 0.001				
Vitamin D	No symptoms/ Mild symptoms	Moderate symptoms	Severe/ very severe symptoms	Total
Yes	50	50	11	111
	45.0%	45.0%	9.9%	100.0%
No	52	64	25	141
	36.9%	45.4%	17.7%	100.0%
Total	102	114	36	252
	40.5%	45.2%	14.3%	100.0%
Chi-square = 3.684; p = 0.159				

Age	No symptoms/ mild symptoms	Moderate symptoms	Severe/ very severe symptoms	Total
Vitamin B	No symptoms/ Mild symptoms	Moderate symptoms	Sever/ very severe symptoms	Total
Yes	44	40	15	99
	44.4%	40.4%	15.2%	100.0%
No	58	74	21	153
	37.9%	48.4%	13.7%	100.0%
Total	102	114	36	252
	40.5%	45.2%	14.3%	100.0%
Chi-square = 1.562; p = 0.458				
Physical activity	No symptoms/ Mild symptoms	Moderate symptoms	Sever/ very severe symptoms	Total
Yes	77	85	20	182
	42.3%	46.7%	11.0%	100.0%
No	25	29	16	70
	35.7%	41.4%	22.9%	100.0%
Total	102	114	36	252
	40.5%	45.2%	14.3%	100.0%
Chi-square = 5.839; p = 0.054				
Being on a special diet	No symptoms/ mild symptoms	Moderate symptoms	Severe/ very severe symptoms	Total
No (general)	94	101	33	228
	41.2%	44.3%	14.5%	100.0%
Yes	8	13	3	24
	33.3%	54.2%	12.5%	100.0%
Total	102	114	36	252
	40.5%	45.2%	14.3%	100.0%
Chi-square = 0.861; p = 0.650				

experiencing PMS symptoms was found in 45.2% (N = 114) of the women while severe and very severe symptoms were found in 14.3% (N = 36) of the respondents.

Values of coefficients for the sum of intensity of symptoms in all the groups are presented in Table 3.

The mean sum of points of physical symptoms was 41.35 while median 41 points. The minimum value obtained was 16 points and the maximum value was 72 points. The mean sum of points of psychological symptoms was 28.73, median 27 points. The minimum value obtained was 12

Table 5. Intensity of physical PMS symptoms in the women researched

Physical symptoms						
Response	Breast tenderness and swelling		Highly/ poorly intensified	Abdominal bloating		Highly/ poorly intensified
	N	%		N	%	
Never	34	13.5	25.8	34	13.5	32.1
Rarely	31	12.3		47	18.7	
Sometimes	54	21.4	21.4	74	29.4	29.4
Very often	82	32.5	52.8	67	26.6	38.5
Always	51	20.2		30	11.9	
Response	Weight gain		Highly/ poorly intensified	Headache		Highly/ poorly intensified
	N	%		N	%	
Never	49	19.4	43.3	83	32.9	67.4
Rarely	60	23.8		87	34.5	
Sometimes	67	26.6	26.6	43	17.1	17.1
Very often	50	19.8	30.2	27	10.7	15.5
Always	26	10.3		12	4.8	
Response	Dizziness/fainting		Highly/ poorly intensified	Fatigue		Highly/ poorly intensified
	N	%		N	%	
Never	152	60.3	82.9	34	13.5	31.1
Rarely	57	22.6		47	18.7	
Sometimes	32	12.7	12.7	93	36.9	36.9
Very often	8	3.2	4.4	59	23.4	32.0
Always	3	1.2		19	7.5	
Response	Palpitations		Highly/ poorly intensified	Pelvic discomfort and pain		Highly/ poorly intensified
	N	%		N	%	
Never	146	57.9	80.9	50	19.8	41.3
Rarely	58	23.0		54	21.4	
Sometimes	34	13.5	13.5	70	27.8	27.8
Very often	11	4.4	5.6	47	18.7	31,.0
Always	3	1.2		31	12.3	
Response	Abdominal cramps		Highly/ poorly intensified	Changes in bowel habits		Highly/ poorly intensified
	N	%		N	%	
Never	38	15.1	32.5	72	28.6	51.2
Rarely	44	17.5		57	22.6	
Sometimes	77	30.6	30.6	66	26.2	26.2
Very often	60	23.8	36.9	37	14.7	22.6
Always	33	13.1		20	7.9	
Response	Increased appetite		Highly/ poorly intensified	Generalized aches and pains		Highly/ poorly intensified
	N	%		N	%	
Never	35	13.9	28.2	71	28.2	54.4
Rarely	36	14.3		66	26.2	
Sometimes	79	31.3	31.3	60	23.8	23.8
Very often	71	28.2	40.5	35	13.9	21.8
Always	31	12.3		20	7.9	

Physical symptoms						
Response	Breast tenderness and swelling		Highly/ poorly intensified	Abdominal bloating		Highly/ poorly intensified
	N	%		N	%	
Response	Food cravings (sugar/salt)		Highly/ poorly intensified	Skin changes, rashes, pimples		Highly/ poorly intensified
	n	%		N	%	
Never	36	14.3	29.0	32	12.7	30.2
Rarely	37	14.7		44	17.5	
Sometimes	76	30.1	30.1	65	25.8	25.8
Very often	63	25.0	40.9	71	28.1	44.0
Always	40	15.9		40	15.9	
Response	Nausea/vomiting		Highly/ poorly intensified	Joint and muscle pains		Highly/ poorly intensified
	n	%		N	%	
Never	158	62.7	75.8	117	46.4	75.8
Rarely	52	20.6		74	29.4	
Sometimes	29	11.5	11.5	34	13.5	13.5
Very often	9	3.6	5.2	21	8.3	10.7
Always	4	1.6		6	2.4	

Table 6. Intensity of psychological PMS symptoms in the women researched.

Psychological symptoms						
Response	Irritability		Highly/ poorly intensified	Anxiety		Highly/ poorly intensified
	n	%		n	%	
Never	20	7.9	18.6	65	25.8	51.2
Rarely	27	10.7		64	25.4	
Sometimes	68	27.0	27.0	55	21.8	21.8
Very often	76	30.2	54.4	35	13.9	27.0
Always	61	24.2		33	13.1	
Response	Tension		Highly/ poorly intensified	Mood swings		Highly/ poorly intensified
	n	%		n	%	
Never	38	15.1	35.7	17	6.7	21.4
Rarely	52	20.6		37	14.9	
Sometimes	62	24.6	24.6	72	28.6	28.6
Very often	55	21.8	39.7	67	26.6	50.0
Always	45	17.9		59	23.4	
Response	Loss of concentration		Highly/ poorly intensified	Depression		Highly/ poorly intensified
	n	%		n	%	
Never	55	21.8	46.8	175	69.4	83.3
Rarely	63	25.0		35	13.9	
Sometimes	68	27.0	27.0	27	10.7	10.7
Very often	31	12.3	26.2	7	2.8	6.0
Always	35	13.9		8	3.2	

Psychological symptoms

Response	Irritability		Highly/ poorly intensified	Anxiety		Highly/ poorly intensified
	n	%		n	%	
Response	Forgetfulness		Highly/ poorly intensified	Crying spells		Highly/ poorly intensified
	N	%		n	%	
Nver	158	62.7	86.9	60	23.8	50.0
Rarely	61	24.2		66	26.2	
Sometimes	18	7.1	7.1	61	24.2	24.2
Very often	9	3.6	6.0	40	15.9	25.8
Always	6	2.4		25	9.9	
Response	Sleep changes (insomnia/ hypersomnia)		Highly/ poorly intensified	Confusion		Highly/ poorly intensified
	n	%		n	%	
Never	102	40.5	64.7	144	57.1	81.3
Rarely	61	24.2		61	24.2	
Sometimes	57	22.6	22.6	30	11.9	11.9
Very often	21	8.3	12.7	12	4.8	6.8
Always	11	4.4		5	2.0	
Response	Aggression		Highly/ poorly intensified	Hopelessness		Highly/ poorly intensified
	n	%		n	%	
Never	130	51.6	71.8	148	58.7	75.0
Rarely	51	20.2		41	16.3	
Sometimes	37	14.7	14.7	38	15.1	15.1
Very often	20	7.9	13.5	16	6.3	9.9
Always	14	5.6		9	3.6	

points whereas the maximum value was 60 points. The mean sum of points of behavioural symptoms was 20.73, median 18 points. The minimum value obtained was 12 points and the maximum value was 60 points.

Dependences between the level of intensity of PMS symptoms and different factors are depicted in Table 4.

Statistical significance was not found ($p>0.05$) analysing age and severity of PMS symptoms. However, it is worth noticing that the highest percentage of the women of 54.4% at the age of 31-35 years old had no symptoms or mild ones. In the case of the comparison of education and severity of PMS symptoms statistical significance ($P<0.005$) was found. The highest percentage of the respondents (61.9%) with no PMS symptoms or mild ones was found in the group of women with primary, post-primary and vocational education. Simultaneously, this category had statistically more frequently severe and very severe symptoms. The lowest percentage (11.1%) of the females suffering from severe and very severe PMS symptoms was fund in the women with higher education. In turn, the highest percentage (53.8%) of the women with moderate PMS symptoms was found in the respondents with secondary education. Taking vitamin D had no statistical significance in severity of PMS symptoms ($p>0.05$). the result obtained were compared in the two categories. No statistical significance was found in dependence of vitamin B supplementation and PMS intensity ($p>0.05$). similarly, no statistical significance was found in dependence between physical activity and severity of PMS symptoms ($p>0.05$). However, it is worth mentioning that the category of physically active women had higher percentage of females with no PMS symptoms or mild ones ($p > 0.05$). No statistical significance was found in dependence between the

Table 7. Intensity of behavioural PMS symptoms in the women researched.

Behavioural symptoms						
Response	Social withdrawal		Highly/ poorly intensified	Restlessnss		Highly/ poorly intensified
	n	%		n	%	
Never	151	59.9	76.6	122	48.4	77.0
Rarely	42	16.7		72	28.6	
Sometimes	35	13.9	13.9	36	14.3	14.2
Very often	19	7.5	9.5	16	6.3	8.7
Always	5	2.0		6	2.4	
Response	Lack of self control		Highly/ poorly intensified	Feeling guilty		Highly/ poorly intensified
	n	%		n	%	
Never	182	72.2	85.3	165	65.5	86.9
Rarely	33	13.1		54	21.4	
Sometimes	24	9.5	9.5	18	7.1	7.1
Very often	8	3.2	5.2	12	4.8	6.0
Always	5	2.0		3	2.0	
Response	Clumsiness		Highly/ poorly intensified	Lack of interest in usual activities		Highly/ poorly intensified
	n	%		n	%	
Never	149	59.1	80.9	124	49.2	72.6
Rarely	55	21.8		59	23.4	
Sometimes	29	11.5	11.5	48	19.1	19.1
Very often	14	5.6	7.6	16	6,3	8.3
Always	5	2.0		5	2.0	
Response	Poor judgement		Highly/ poorly intensified	Impaired work performance		Highly/ poorly intensified
	n	%		n	%	
Never	187	74.2	89.3	100	39.7	68.3
Rarely	38	15.1		72	28.6	
Sometimes	18	7.1	7.1	57	22.6	22.6
Very often	6	2.4	3.6	14	5.6	9.1
Always	3	1.2		9	3.6	
Response	Obsessional thoughts		Highly/ poorly intensified	Compulsive behaviour		Highly/ poorly intensified
	n	%		n	%	
Never	156	61.9	81.0	183	72.6	88.9
Rarely	48	19.0		41	16.2	
Sometimes	26	10.3	10.3	18	7.1	7.1
Very often	14	5.6	8.7	5	2.0	4.0
Always	8	3.2		5	2.0	
Response	Irrational thoughts		Highly/ poorly intensified	Being over sensitive		Highly/ poorly intensified
	n	%		n	%	
Never	176	69.8	86.1	93	36.9	52.8
Rarely	41	16.3		40	15.9	
Sometimes	24	9.5	9.5	68	27.0	27.0
Very often	7	2.8	4.4	26	10.3	20.2
Always	4	1.6		25	9.9	

type of diet used and intensity of PMS symptoms ($p>0.05$). The results obtained in all the groups were similar.

In the research, intensity of particular PMS symptoms was of great interest; the results are depicted in tables 5-7.

The most common physical PMS symptoms always and very often experienced by the females were breast tenderness and swelling (52.8%), skin changes, rashes and pimples (44%), food cravings for sugar and salt (40.9%), increased appetite (40.5%), abdominal bloating (38.5%), abdominal cramps (36.9%), weight gain (32.2%), pelvic discomfort and pain (31%), and fatigue (32%). The symptoms that were indicated as never experienced during the second phase of menstrual cycle are as follows: dizziness and fainting, palpitations, joint and muscle pains, and headache.

The most severe psychological symptoms experienced by the females researched in the last phase of menstrual cycle are irritability (54.4%), mood swings (50%), tension (37.9%). Loss of concentration (27%), crying spells (24.4%) and anxiety (21.8%) sometimes occur in the women. Such symptoms as depression, forgetfulness, confusion, sleep disorders (insomnia or hypersomnia), aggression and hopelessness never or rarely occur in the women researched.

In the research conducted, behavioural PMS symptoms are the most rare ones. The Most of the women provided frequency of always and very often for the following symptoms: being over sensitive (22.2%), impaired work performance (9.1%), lack of interest in usual activities (8.3%), social withdrawal (9.5%) and restlessness (8.7%). In the last phase of the cycle, the females did not have or rarely had the following symptoms: compulsive behaviours, irrational thoughts, obsessional thoughts, poor judgement, clumsiness, feeling guilty and loss of self-control.

3. Discussion

Prevalence of PMS is very differentiated and differs depending on the selection of diagnostic criteria, subjective PMS symptoms and social and cultural differences of the populations researched. Epidemiological studies demonstrated that approximately 80–90% of females declare at least one of the PMS symptoms (Fatemi, Allahdadian, Bahadorani, 2019). The most intense PMS symptoms manifest in the age range of 25-35 years old (Pałucka et al., 2016). In the authors' own research, the research group was 20-35 years old. Although no statistical significance was found between age and severity of PMS symptoms, more than a half of the females researched (54.4%) who was observed to report no symptoms or mild ones were in the highest age range, namely 31-35 years old. Other authors noticed a tendency to diminishing severity of PMS symptoms along with age (Sut, Mestogullari, 2016). In the analysis of the impact of women's age on PMS occurrence and severity, the research on 500 females by Freeman at al. (2009) is worth mentioning. Probability of PMS in women aged 40-44 years old was ascertained to be 41% less than in women aged 35-39 years old. In turn, in the age group of 50-54 years old it was 79% less than in the age group of 35-39 years old.

In the authors' own research, almost a half of the respondents (45.2%) was found to experience PMS symptoms at the moderate level and 40.1% had mild symptoms. Solely 14.3% of the females assessed them as severe. Interestingly, only one woman (0.4%) reported to have no PMS symptoms. Other authors observed that diagnosis of PMS can be made in 38.1% of women by means of a similar scale for assessing PMS symptoms (Sut, Mestogullari, 2016). Still other researchers noticed that all women researched experienced at least one of the PMS symptoms. A total of 58.3% and 17.1% of the respondents respectively had moderate and severe PMS symptoms (Abu Alwafa, Badrasawi, Haj Hamad, 2021).

The study of 2500 Polish women of reproductive age showed that prevalence of PMS and PMDD was 76.39% and 4.17% respectively (Drosdzol, Nowosielski, Skrzypulec, Plinta, 2011). Other Polish authors observed that prevalence of PMS was found in 42% of professional sportswomen aged 16-22 years old (Czajkowska, Drosdzol-Cop, Naworska, Galazka, Gogola, Rutkowska, Skrzypulec-Plinta, 2020).

In the authors' own research, regarding particular symptoms in the luteal phase of the cycle in PMS, the research indicated the most intensified somatic

symptoms such as breast tenderness and swelling, increased appetite, food cravings for sugar and salt, skin changes, abdominal bloating, fatigue and abdominal cramps. In turn, psychological symptoms declared by the women researched included irritability, mood swings, tension, loss of concentration, crying spells and anxiety. Behavioural symptoms were the most rare and encompassed being over sensitive, impaired work performance, lack of interest in usual activities, social withdrawal, and restlessness. Similarly, in the work of Rozende at al. (2022), physical symptoms were the most common (breast tenderness, headache, joint and muscle pains, oedema and weight gain) and followed by eagerness to overeat/eagerness to eat. In turn, in the work by other authors (Kozłowski, Kozłowska, Kozłowska, Cisło, 2017) psychological symptoms were the most intense; first irritability and emotional lability, then decreased mood, lower self-esteem, anxiety and nervous tension.

The relationship between the level of education and PMS was well documented in the literature. In the population research in Great Britain, reverse linear dependence was found in which the lowest level of education was associated with frequent occurrence of PMS symptoms. However, the Brazilian study showed high occurrence of PMS in women with higher education (Rezende et al., 2022). In the authors' own research, statistically significant dependence was found in the relationship between the level of education and intensity of PMS ($P<0.05$). Interestingly, the highest percentage of the respondents (61.9%) was found in the group of the women with primary, post-primary and vocational education who experienced no PMS symptoms or ones. Simultaneously, in this category the women with severe and very severe PMS symptoms were statistically more frequently found. The lowest percentage of the females with severe and very severe PMS symptoms was observed in the women with higher education (11.1%). In turn, the highest percentage of the women with moderate PMS symptoms was noticed in the women with secondary education (53.8%).

Approximately 80% of daily requirement for vitamin D is usually met by 7-dehydrocholesterol due to ultraviolet radiation and the rest 20% is provided with food. The role of vitamin D in reducing the risk of PMS is still researched and it seems it is mainly correlated with modulation of calcium concentration, some neurotransmitters and sex hormones. In the research by Abdi et al. (2019) based on a systematic review, a low level of vitamin D and calcium in the luteal phase of the menstrual cycle was shown to cause and/or intensify PMS symptoms. However, in this work no statistically significant dependence was noticed between vitamin D supplementation and intensity of PMS symptoms in females researched. Group B vitamins are essential in the synthesis of neurotransmitters potentially involved in pathophysiology of PMS. However, no association was found with group B vitamins supplementation and severity of PMS symptoms. Taking supplements of group B vitamins was not related to a lower risk of PMS (Siminiuc, Țurcanu, 2023; Retallick-Brown, Blampied, Rucklidge, 2020). In the authors' own research, supplementation of group B vitamins also was not associated with milder PMS symptoms. Moreover, no statistical significance was found between the type of diet and severity of PMS symptoms. However, it should be highlighted that the influence of nutrition on PMS is confirmed, in particular regarding a negative impact of fast food, deep-fried food, coffee and alcohol since it is significantly related to PMS development. Whereas consumption of fruit and vegetables can decrease PMS symptoms (Kwon, Sung, Lee, 2022). The main aim of PMS treatment is reducing the symptoms and decreasing its influence on daily living. Pharmacotherapy has always been the first-line treatment of PMS but the latest research shows better benefits of combined therapy. The combination of pharmacotherapy (anxiolytics; non-steroidal anti-inflammatory drugs, NSAIDs; gonadotropin-releasing hormone agonists, GnRH agonists; selective serotonin reuptake inhibitors, SSRIs; spironolactone; oral contraceptives) with non-pharmacological therapy like appropriate physical activity and modifying nutrition turned out to be beneficial in PMS management (Gudipally et al., 2020). However, in the authors' own research no dependency between pharmaceuticals taken and occurrence, and severity of PMS symptoms was observed, which can be explained by a low number of the respondents taking any drugs used to treat PMS.

Physical activity has a positive influence on the reduction of PMS, which is well documented in the scientific research. In the systematic review of 17 studies by Saglam and Orsal (2020), the research encompassed the effect of physical activity such as yoga, aerobic exercise, swimming and Pilates on PMS symptoms. The results clearly showed that irrespective of the type of physical activity, regular exercise seems to be effective in alleviation of symptoms. In the authors' own research no statistical dependence was found between physical activity and intensity of PMS symptoms ($p>0.05$). However, it is worth mentioning that in the category of physical active women a higher percentage of women free from PMS symptoms or with mild ones was found.

The strength of the research conducted was the application of a standardized research instrument of the PMSS due to which not only particular PMS symptoms were depicted in the women researched but also intensity of the symptoms. The work presents preliminary research results that suggest the need for further investigations in the subject area. Weakness of the research performed constitutes quite a low number of the females in the research group, not representative for the entire population of women in Poland, students of universities in Lublin and patients of one outpatient clinic for women in the Lublin region. Therefore, some next research should be carried out in the all-Poland population and also supplemented with additional questions regarding, e.g. health status of respondents.

While analysing the literature available, very differentiated diagnostic methods can be observed to identify PMS. This makes the comparison of frequency and intensity of PMS symptoms difficult. Moreover, there is scarce current research into PMS in women in Poland. The vast majority of the research in this area constitutes foreign studies. This makes the comparison of own results with research on women in Poland difficult though such a comparison could more precisely reflect the picture of PMS symptoms in the group researched of similar socio-cultural background. Thus, an increase in interest in the subject area should be considered also in the Polish scientific environment mainly due to the fact that PMS phenomenon is of great significance in public health. The main challenges related to research into PMS encompass their subjective character of PMS symptoms and variability of menstrual patterns at different reproductive stages that require appropriate diagnostic criteria (Itriyeva, 2022; Khalida, 2022).

Conclusions

1. The vast majority of the females experience at least one PMS symptom. Nearly a half of the women suffer from premenstrual disorders moderately. Among the category of symptoms that occur the most commonly, physical symptoms are found, in particular breast tenderness and swelling, skin lesions and food cravings. Another category of psychological symptoms mainly include irritability, mood swings, tension, poor concentration, crying spells and anxiety. Behavioural symptoms are the most rare ones and the most commonly encompass being over sensitive, impaired work performance, lack of interest in usual activities, social withdrawal and restlessness.
2. The results obtained in the preliminary research indicate the necessity of further investigations in this scope and referring to women of different age groups, of different health status, level of education and differentiated health behaviours.

Bibliography

Abu Alwafa, R., Badrasawi, M. & Haj Hamad, R. (2021). Prevalence of premenstrual syndrome and its association with psychosocial and lifestyle variables: a cross-sectional study from Palestine. *BMC Women's Health, 21*(233). https://doi.org/10.1186/s12905-021-01374-6

Abdi, F., Ozgoli, G. & Rahnemaie, F.S. (2019). A systematic review of the role of vitamin D and calcium in premenstrual syndrome. *Obstetrics & Gynecology Science*, *62*(2), 73-86. https://doi.org/10.5468/ogs.2019.62.2.73

American Psychiatric Association. Diagnostic and Statistical Manual of Mental Disorders, 5th ed. (2013). Washington, DC: American Psychiatric Association Publishing.

Czajkowska, M., Drosdzol-Cop, A., Naworska, B., Galazka, I., Gogola, C., Rutkowska, M., Skrzypulec-Plinta, V. (2020). The impact of competitivesports on menstrualcycle and menstrualdisorders, includingpremenstrualsyndrome, premenstrualdysphoricdisorder and hormonalimbalances. *Ginekologia Polska*, *91*(9), 503-512. https://doi.org/10.5603/GP.2020.0097.

Drosdzol, A., Nowosielski, K., Skrzypulec, V., Plinta, R. (2011). Premenstrualdisorders in Polish adolescent girls: Prevalence and riskfactors. *Journal of Obstetrics and Gynaecology-Research*, *37*(9), 1216-1221. https://doi.org/10.1111/j.1447-0756.2010.01505.x

Fatemi, M., Allahdadian, M., Bahadorani, M. (2019). Comparison of serum level of some trace elements and vitamin D between patients with premenstrual syndrome and normal controls: A cross-sectional study. *International Journal of Reproductive Biomedicine, 17*(9), 647-652. https://doi.org/10.18502/ijrm.v17i9.5100

Frey Nascimento, A., Gaab, J., Kirsch, I., Kossowsky, J., Meyer, A., Locher, C. (2020). Open-label placebo treatment of women with premenstrual syndrome: study protocol of a randomised controlled trial. *British Medical Journal*, 10(2), e032868. https://doi.org/10.1136/bmjopen-2019-032868

Itryieva, K. (2022). Premenstrual Syndrome and Premenstrual Dysphoric Disorder in adolescents. *Current Problems in Pediatric Adolescent Health Care*, 52(5),101187. https://doi.org/10.1016/j.cppeds.2022.101187

Khasanova, D. (2022). Premenstrual Syndrome in the modern science. *International Bulletin of Medical Sciences and Clinical Research*, *2*(12), 16–22.

Kozłowski, P., Kozłowska, M., Kozłowska, K., Cisło M. (2017). The prevalence of premenstrual syndrome in young woman. *Journal of Education, Health and Sport*, (7), 866-872.

Kwon, Y.J., Sung, D.I. & Lee, J.W. (2022). Association among premenstrual syndrome, dietary patterns, and adherence to mediterranean diet. *Nutrients*, *14*(12), 2460. https://doi.org/10.3390/nu14122460

Molugulu, N., Tumkur, A.N.I.L., 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.

Nappi, R.E. Cucinella L., Bosoni, D., Righi, A., Battista, F., Molinaro, P., Stincardini, G., Piccinino, M., Rossini, R., Tiranini, L. (2022). Premenstrual Syndrome and Premenstrual Dysphoric Disorder as Centrally Based Disorders. *Endocrines*, *3*, 127-138. https://doi.org/10.3390/endocrines3010012

Osborn, E., Wittkowski, A., Brooks, J. *Briggs, P.E.,* Shaughn O'Brien, P.M. (2020). Women's experiences of receiving a diagnosis of premenstrual dysphoric disorder: a qualitative investigation. *Boston Medical Center Women's Health,* 20, 242. https://doi.org/10.1186/s12905-020-01100-8

Padmavathi, P., Sankar, R., Kokilavani, N., Dhanapal, K., AshokB. (2014). Validity and Reliability Study of Premenstrual Syndrome Scale (PMSS), *International Journal of Contemporary Management, 2*(1), 04-05.

Pałucka, K., Łepecka-Klusek, C., Pilewska-Kozak, A.B., Pawłowska-Muc, A.K., Stadnicka G. (2016). Premenstrual syndrome – myth or reality. *Journal of Education, Health and Sport*, *6*(6): 478-490.

Pokharel, P., Rana, J., Moutchia, J., Uchai, S., Kerri, A., Gutiérrez, P.L. L., Islam, R.M. (2020). Effect of exercise on symptoms of premenstrual syndrome in low and middle-income countries: a protocol for systematic review and meta-analysis, *British Medical Journal Open*, *10*(9), e039274. https://doi.org/10.1136/bmjopen-2020-039274

Retallick-Brown, H., Blampied, N., Rucklidge, J.J. (2020). A Pilot randomized treatment-controlled trial comparing vitamin B6 with broad-spectrum micronutrients for premenstrual syndrome. *The Journal Alternative Complementary Medicine*, 26, 88–97. https://doi.org/10.1089/acm.2019.0305

Rezende, A.P.R., Alvarenga, F.R., Ramos, M., Franken, D.L., Costa, J.S. D.D., Pattussi, M.P. & Paniz, V.M.V. (2022). Prevalence of premenstrual syndrome and associated factors among academics of a university in midwest Brazil. *RevistaBrasileira de Ginecologia e Obstetrícia*, *44*, 133-141.https://doi.org/10.1055/s-0041-1741456

Ryu, A, Kim, T.H. (2015). Premenstrual syndrome: A mini review. *Maturitas*, 2015;82(04), 436-440. https://doi.org/10.1016/j.maturitas.2015.08.010

Schroll, J.B., Lauritsen, M.P. (2022). Premenstrual dysphoric disorder: A controversial new diagnosis. *Acta Obstetricia and Gynecologica Scandinavica, 101*(5), 482-483. https://doi.org/10.1111/aogs.14360

Sieradzy, K., Sieńko, K. Płoch K. (2017). Objawy przedmiesiączkowe u kobiet w wieku 16-35 lat. *Położna Nauka i Praktyka, 2*, 8-14.

Siminiuc, R., Țurcanu, D. (2023). Impact of nutritional diet therapy on premenstrual syndrome. *Frontiers in Nutrition*, *10*, 1079417. https://doi.org/10.3389/fnut.2023.1079417

Sut, H.K., Mestogullari, E. (2016). Effect of premenstrual syndrome on work-related quality of life in Turkish nurses. *Safety and Health at Work*, *7*(1), 78-82. https://doi.org/10.1016/j.shaw.2015.09.001

Śliwerski, A., Koszałkowska, K. (2021). The influence of depression on biased diagnosis of premenstrual syndrome and premenstrual dysphoric disorder by the PSST inventory. *Life*, 11(11),1278. https://doi.org/10.3390/life11111278