VILNIUS UNIVERSITY
FACULTY OF MEDICINE

Medicine

Clinic of Obstetrics and Gynaecology

Damma Al-Diwan, VI year, 6 group

INTEGRATED STUDY MASTER'S THESIS

Premenstrual Disorders Impact on Quality of Life

Supervisor Assoc. Prof. Virginija Paliulytė

The Head of Department/Clinic Prof. Diana Ramašauskaitė

Vilnius, 2025

damma.aldiwan@mf.stud.vu.lt

TABLE OF CONTENT

1. ABSTRACT

This research emphasizes the importance of understanding premenstrual disorders (PMDs) and their significant impact on women's health and quality of life (QoL). It aims to raise awareness and promote innovative clinical practices to enhance diagnostic criteria, advance management strategies, and improve treatment protocols, ultimately leading to better health outcomes. The main objectives are to address the complexities of PMDs, identify critical research gaps, raise public awareness of the significant impact of PMDs on women's health and societal well-being, and lay the foundation for future studies that will refine clinical practices and public health policies. This will ultimately reduce the broader societal and economic burdens of PMDs.

Research methods: A specifically designed questionnaire was distributed among women across Europe through various social media platforms and electronic communication channel. Data were collected between November 2023 and November 2024. Collected survey responses underwent statistical evaluation using the R Commander software.

Results: Statistical significant relationships were found between lifestyle and physical and psychological symptoms, and a higher likelihood of PMS diagnosis ($p = 0.042$). The age of first menstruation was significantly linked to menstrual cycle severity ($p = 0.0128$), and irregular cycles correlate with a higher incidence of PMS, PMDD, and various psychological and physical symptoms. 66.2% of participants reported that PMD symptoms negatively impacted daily activities. Health conditions including headaches, chronic pain, diabetes, thyroid conditions, gynaecological issues, and mood disorders were significantly associated with specific PMS symptoms, including painful/swollen breasts and food cravings. Women with a history of trauma or stress experienced more intense psychological and physical symptoms. Family history of PMS and mood disorders was prevalent among 29 participants, with 13 having been diagnosed with related conditions.

Conclusions: This study highlighted the profound impact of PMDs on women's health and quality of life. Findings revealed a potential genetic link between family history and PMS prevalence. A wide range of physical and psychological symptoms linked to PMDs significantly correlate with irregular cycles and health conditions. Over half of the participants reported that PMD symptoms hindered their daily functioning, reinforcing the importance of societal recognition of the issue. These findings suggest the need for a multifaceted approach to diagnosis and treatment, recommending that clinical practices consider the diverse nature of PMDs, incorporating symptoms and lifestyle factors for developing more nuanced and effective management strategies.

Abbreviations: PMS = premenstrual syndrome, PMDD = premenstrual dysphoric disorder, PMDs = Premenstrual disorders, QoL = Quality of Life

Keywords: premenstrual disorders, premenstrual syndrome, mood disorders, menstrual disorders, stress and menstruation, quality of life.

2. INTRODUCTION

Premenstrual disorders (PMDs) are prevalent conditions affecting millions of women worldwide, significantly disrupting their daily lives, affecting their physical, emotional, and psychological wellbeing (1). While some level of discomfort is common, severe manifestations that impair daily functioning should not be dismissed as a "normal" part of the menstrual cycle. Despite the high prevalence and impact, PMDs remain underdiagnosed and under-researched (2–4). In a recent study, Opatowski and colleagues reported that PMDs are associated with an increased risk of morbidity and mortality, including cardiovascular disease, neoplasms, and suicide, highlighting the importance for early diagnosis and treatment. Notably, women diagnosed with PMDs before the age of 25 have an increased risk of mortality compared to women without PMDs (5). PMDs still often go undiagnosed or dismissed as a normal aspect of the menstrual cycle rather than recognized as conditions requiring medical attention and intervention (1,6). As a result, many women are left without the appropriate care and treatment. Addressing the complexities of PMDs is essential for improving the diagnosis, treatment, and support systems for those affected.

The reported prevalence of premenstrual disorders (PMDs) varies widely across studies, with estimates ranging from 10% to 98% in different countries (7,8). Studies indicate that around 75% of menstruating women worldwide experience some form of PMS symptoms, with 3-8% of these individuals suffering from severe PMS that significantly affects their daily functioning and quality of life (3,7,9,10). Around 1.6% of menstruating women, which translates to approximately 31 million women globally, based on estimates of the global population of menstruating women, experience severe PMDD (8,11,12). A recent systematic review of randomized controlled trials reported a PMDD prevalence of 3%-8%, while PMS has an estimated global prevalence of 48% (13,14). The prevalence of PMS varies by region, ranging from as low as 12% reported in France to as high as 98% in Iran (12,14,15).

The functional impairment caused by PMDs is evident in both work and interpersonal relationships(4). Up to 20% of reproductive-aged women report experiencing premenstrual symptoms that lead to substantial functional impairment, highlighting the substantial impact these conditions have on women's daily lives, at home, in the workplace, and in social settings (15,16). Further evidence from an online study in the Netherlands, involving 32,748 women aged 15-45, found that 1 in 7 women (14% of respondents) took days off from work or school due to premenstrual symptoms, with an average in productivity loss of 9 days per year (4,17–19). Another significant finding was that 50% of women reported being unable to perform their work duties due to severe abdominal pain, a key symptom of PMDs (17).

Characterized by its onset during the luteal phase of the menstrual cycle, PMDs involve a complex interplay of biological, genetic, and environmental factors (12). This multifactorial nature makes PMDs challenging to fully comprehend and treat effectively (20). Gaining insight into the underlying causes of PMDs is essential for developing targeted and more effective treatment options that can alleviate symptoms and improve the quality of life for women living with PMDs.

While the exact causes of premenstrual disorders (PMDs) remain unclear, they are believed to involve a combination of various risk factors, including hormonal fluctuations, genetic predispositions, neurotransmitter imbalances, and the individual sensitivity to these factors (21). Hormonal changes, particularly during the luteal phase of the menstrual cycle, play a central role in the emotional and physical symptoms of PMDs, while neurotransmitter imbalances—especially serotonin dysregulation—contribute to mood disturbances, such as anxiety, irritability, and depression. Genetic factors have shown to increase susceptibility, with individuals having a family history of PMS or PMDD being more vulnerable to developing these disorders (22–24). Psychological factors like stress, anxiety, and depression, along with lifestyle factors such as diet, lack of exercise, and substance use, can exacerbate PMD symptoms (22,25,26). Pre-existing medical conditions, such as ADHD, endometriosis or polycystic ovary syndrome (PCOS), may also affect the severity of PMS symptoms. Furthermore, some studies suggest that elevated levels of inflammation during the luteal phase may worsen both physical and emotional manifestations of PMDs (20,27–30). These risk factors, combined with hormonal and neurobiological influences, contribute to the complexity of PMDs, influencing both the severity and presentation of symptoms.

Women with Premenstrual Disorders (PMDs) experience a broad spectrum of both physical and psychological symptoms, ranging from mild irritability and bloating to severe mood swings, anxiety, and debilitating physical pain. Common physical manifestations include bloating, breast

tenderness, headaches, muscle pain, fatigue, and food cravings (12,23,24). PMDs are characterized by pronounced physical discomfort combined with significant psychological disturbances, including mood swings, depression, irritability, anxiety, and, in severe cases, suicidal thoughts. Behavioural changes, such as sleep disturbances, appetite changes, and cognitive difficulties (e.g. difficulty concentrating), also frequently occur (23). While PMS involves a combination of these symptoms, PMDD is distinguished by its debilitating severity that remarkably impacts mental health and daily functioning, often leading to substantial impairment in an individual's overall quality of life (3,16). These symptoms can profoundly affect an individual's quality of life, impacting interpersonal relationships, daily productivity, and overall well-being. While approximately 80% of women experience at least one physical or psychological symptom during their menstrual cycle, these symptoms typically do not cause major disruptions to their daily activities for the majority of women (15) (*more symptoms are listed in Table 1, Annex 1*).

PMDs are diagnosed through a thorough medical assessment, including symptom history, menstrual cycle details, and exclusion of other conditions (4). Management involves a holistic approach, including lifestyle modifications, pharmacological treatments, and psychological support to alleviate symptoms. In severe cases, a surgical intervention may be considered to eliminate the menstrual cycle and reduce symptoms (22–24). Besides, having a support system is key for effective management and symptom relief (31).

PMDs are more than a personal health concern; they have broad implications for public health. They significantly impair productivity, increase absenteeism in both workplaces and educational settings, and lower the overall quality of life for those affected (4,10,17,18,32,33). Women with PMDs report taking significantly more days off per month compared to their counterparts without PMDs (17,34,35). The economic burden associated with lost productivity and increased healthcare utilization is considerable (17,32,35,36). Addressing PMDs effectively could enhance workplace efficiency, improve academic performance, and reduce healthcare costs. Moreover, by improving the management of PMDs, we can contribute to a healthier, more productive society.

Current literature on PMDs reveals several notable gaps, particularly in addressing the psychological impacts—such as anxiety and depression, and their interaction with the physical symptoms (1,37). Moreover, there is a deficiency in studies focusing on the experiences of diverse populations, including women from different racial and ethnic backgrounds (1,7). This lack of representation may lead to generalized treatment approaches that are not equally effective for all. This study aims to address these gaps by exploring the psychological dimensions of PMDs and

examining its impact across various demographic groups, thereby contributing to a more inclusive and nuanced understanding of the syndrome.

In addressing these gaps, it is also essential to recognize PMDs as an interdisciplinary concern that intersects with multiple fields, including gynaecology, psychology, endocrinology, public health, and sociology (4,38–40). Findings from this research have the potential to play a key role in shaping best practices within each of these disciplines. For example, a better understanding of the hormonal and psychological mechanisms underlying PMDs could inform effective gynaecological treatments (20). Simultaneously, insights into their mental health impact could improve psychological support methods. Moreover, this research could inform public health policies by providing evidence for workplace accommodations and interventions to support individuals affected by PMDs. By connecting these disciplines, this research aims to foster integrated solutions with wide-reaching benefits.

Building on this interdisciplinary foundation, the clinical significance of uncovering the root causes of PMDs is immense (4,38). Pinpointing the underlying mechanisms—whether hormonal, genetic, or neurological—can transform diagnosis and treatment, facilitating more personalized and effective therapies (4). Such advancements could reshape clinical practice, ensuring healthcare providers can offer targeted treatments that better address the specific needs of those affected. Ultimately, improving diagnostic accuracy and therapeutic interventions has the potential to significantly enhance the quality of life for individuals living with PMDs (3,15,16).

This research aims to enhance the understanding of premenstrual disorders (PMDs) by identifying individual differences in experiences and addressing their significant impact on women's health and quality of life (QoL). It seeks to improve management strategies and personalize treatments to enhance health outcomes while identifying key research gaps and establishing a foundation for future studies. By refining diagnostic criteria, supporting the development of innovative treatments, and promoting improvements in clinical practices and public health policies, the study strives to improve women's overall well-being, reduce stigma, and ensure that women receive timely and appropriate care. Ultimately, it aspires to reduce the societal and economic burden of PMDs, including productivity loss, absenteeism, and healthcare costs, while advancing both clinical and public health initiatives.

3. METHODS

This research implemented a cross-sectional, multi-national approach, encompassing various European countries. Data collection was facilitated through the distribution of an online questionnaire, which was disseminated electronically to female participants across Europe.

A unique survey (see annex 2) was designed to elicit information from participants regarding their menstrual cycles and associated symptomatology. The questionnaire comprised 39 questions, which aimed to assess participants' general health, the characteristics of their menstrual cycles, and the symptoms they experience throughout their cycles. It was structured into several sections, including general health, menstrual cycle characteristics, and symptomatology. The general health section included questions about pre-existing conditions such as the presence of any physical or mental illnesses. The menstrual cycle characteristics section gathered information regarding the length, regularity, and average duration of participants' menstrual cycles. The symptomatology section was further divided into two questions: one addressing physical symptoms and the other focusing on psychological symptoms and behavioural changes.

The questionnaire predominantly consisted of multiple-choice questions, yes/no type questions, and a limited number of open-ended questions. Participants were instructed to answer each question to the best of their ability, with definitions provided for any medical terms used. The estimated time to complete the questionnaire was approximately 10 to 15 minutes.

Data collection was conducted anonymously to ensure participant confidentiality. The survey was administered via Google Forms, which provided automatic data visualization in the form of pie charts and bar graphs for ease of analysis.

Participant recruitment was conducted through various social media platforms and electronic communication channels, including Facebook, email, and WhatsApp. The inclusion criteria were limited to female residents of European countries, with no age restrictions or health limitations imposed. Educational attainment was not considered as a factor in the selection process. This methodology was employed to ensure a diverse and representative sample of the target population while maintaining geographical consistency within the European context.

Statistical analyses were conducted using the R Commander software. To determine statistical significance, both Fisher's exact test and the Chi-square test for independence were utilized. Fisher's

exact test was applied in cases where the dataset contained small sample sizes (fewer than five observations) or zero counts, while the Chi-square test for independence was used when the frequency exceeded five to examine the potential presence of statistically significant associations between variables. In instances where two compared groups had zero counts, statistical significance was not calculated.

The demographic data pertaining to the age distribution of female respondents were analysed, with the modal value calculated and subsequently visualized as proportional segments in a circular diagram. Similarly, most of the survey questions were presented in circular diagrams to visualize the distribution of responses across different categories.

The occupational information of participants was quantified and presented as frequency distributions in a bar chart. A similar approach was applied to questions 4, 6, 11, 15, 23, 26, and 34 of the survey, which were analysed and illustrated as a bar chart to visualize the frequency of responses across the different categories. Question 6 involved participants to self-report their health status, while questions 11 and 34 focused on existing health conditions and conditions for which participants were taking medication. Question 23 focuses on how the symptoms experienced by participants affect their daily lives. These responses were also depicted in bar charts to illustrate the different health conditions as well as the distribution across the reported conditions.

To explore further relationships, several key correlations were assessed. These included the association between BMI and menstrual cycle symptoms, the effect of trauma on symptoms, and the link between menstrual cycle irregularity and the occurrence of various health conditions, with the regularity of cycles assessed in relation to the presence of specific health conditions. The influence of the age of menarche on symptom severity was also examined. Additionally, comparisons were made between women diagnosed with premenstrual disorders (PMDs) and the general population, specifically concerning low energy and lack of motivation. The impact of certain health conditions on both physical and psychological symptoms was explored, as well as the effects of exercise, yoga, and meditation or prayer on certain symptoms and health conditions. Data were organized into tables, and p-values were calculated to determine statistical significance.

For the purpose of statistical analyses and to enhance data presentation, the responses from several survey questions were organized into tables. Specifically, the symptoms reported in questions 18 and 19, along with responses from questions 7, 11, 13, 17, 31, 33, 35, and 36, were structured into tables to facilitate both calculation and clear visualization. This approach enabled the efficient

application of statistical methods to assess relationships between the symptoms and other variables. The responses were used to explore these associations and to illustrate the data in a structured manner, making it easier to identify patterns and draw meaningful conclusions.

4. RESULTS

A total of 136 women participated in completing the questionnaire. While most questions were fully answered, some were left unanswered. These incomplete responses were excluded from the statistical analyses. Likewise, certain questions allowed for multiple answer choices, leading to a total response count exceeding 136.

As illustrated in Figure 1, 49.3% of the participants were aged between 21 and 30 years. The majority of participants were students (48), employed in healthcare (33), or working in office environments (30), as shown in Figure 2. Additionally, among the study participants 67.6% reported having a partner (Figure 3). More than half of the respondents (55.1%) had not experienced pregnancy at the time of the study (Figure 4).

The overall health status of women presents a nuanced picture when comparing self-reported perceptions with objective measurements. While a substantial majority (77.9%) of female respondents described themselves as "rather healthy," an examination of their body mass index (BMI) reveals a notable discrepancy between perceived and actual health status.

Analysis of BMI data indicates that a significant portion (50%) of participants exhibited BMI values outside the range considered healthy (18.5-25 kg/m^2). Specifically, 9.6% of participants were categorized as underweight (BMI <18.5 kg/m^2), while 40.5% were classified as overweight (BMI >25 kg/m^2) (figure 5 and 6) (41,42). This discrepancy between self-perception and objective health indicators merits deeper exploration.

Intriguingly, despite the high the prevalence of BMI values indicative of potential health concerns, 106 out of 136 participants reported leading a "rather healthy" lifestyle. Interestingly, this self-assessment appears to be at odds with subsequent responses where some participants disclosed having chronic health conditions (figures 5, 7 and 8).

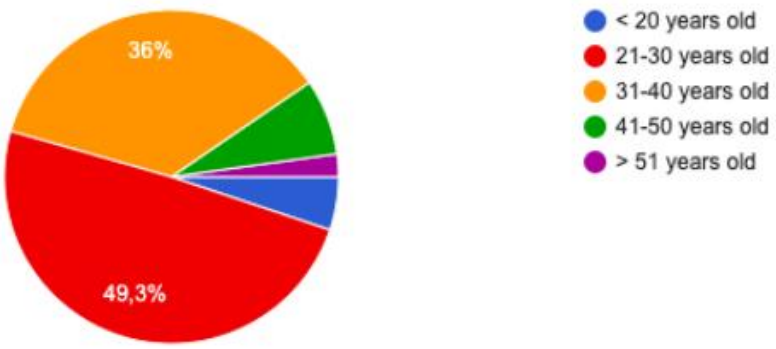

Figure 1. Age Distribution of Participants (n = 136). This figure shows the distribution of ages among the study participants, with the majority of respondents between 21 and 30 years old, followed by those in the 31-40 year age group.

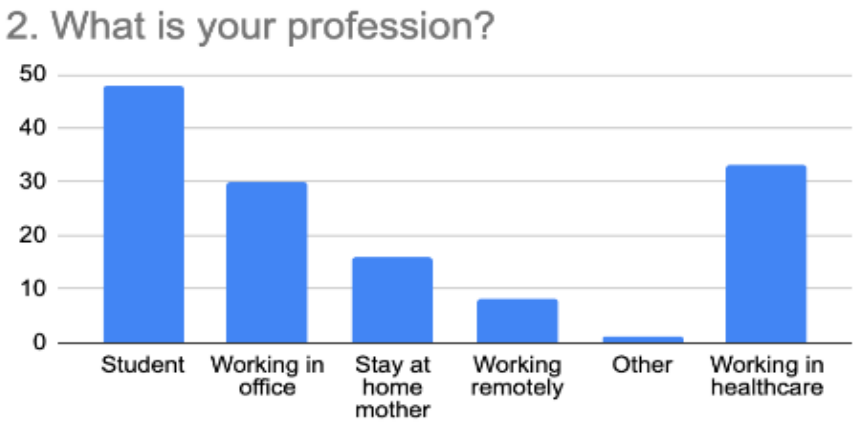

Figure 2. Professional Occupation of Participants (n = 136). This figure outlines the professional backgrounds of the participants. The most common occupations were students (48), healthcare workers (33), and office workers (30).

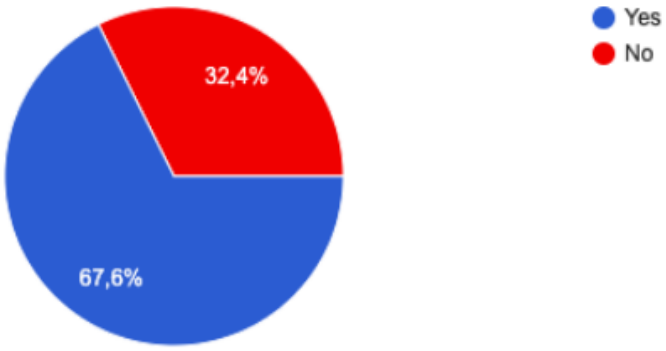

Figure 3. Relationship Status of Participants (n = 136). This figure highlights the relationship status of the participants, showing that 67.6% of respondents reported having a partner.

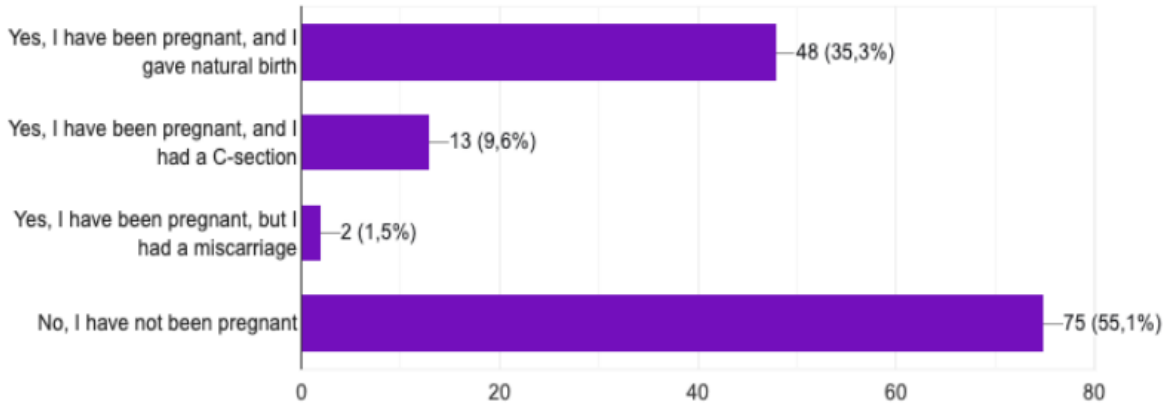

Figure 4. Pregnancy and Labour History of Participants (n = 136). This figure presents the reproductive history of participants. 55.1% (75 respondents) had not experienced pregnancy, while 35.3% (48 women) had been pregnant and given birth naturally.

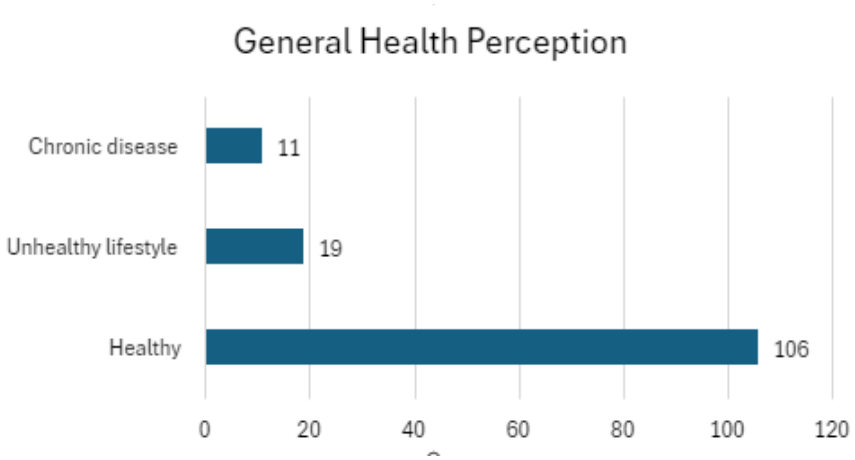

Figure 5. General Health Perception of Participants (n = 136). This figure illustrates the self-reported general health status of the participants. A substantial majority (77.9%, or 106 participants) of respondents described themselves as "rather healthy," despite the objective health measures indicating some discrepancies, e.g. BMI data showing that many fall outside the healthy range.

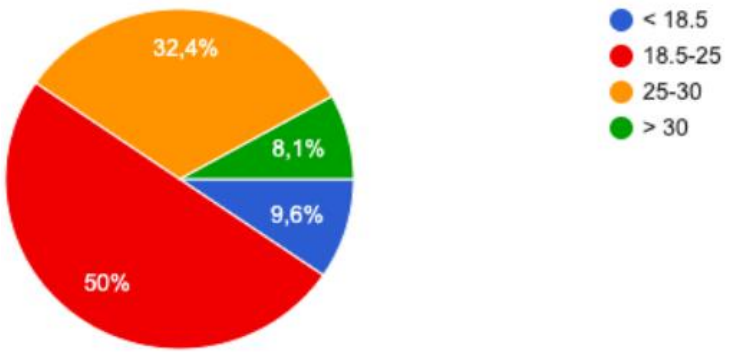

Figure 6. BMI Distribution of Participants (n = 136). This figure displays the body mass index (BMI) distribution of the participants. 50% of the participants had a BMI value within the normal range (18.5-25 kg/m²), while the other 50% fell outside this range (either underweight or overweight).

That said, a closer examination of the data reveals a more complex picture. While only 11 women reported having a chronic disease in response to Question 6 of the questionnaire, further analysis of responses to Questions 11 and 34 provides additional insights. A total of 75 out of the 136 participants reported having a health condition. Of these, 68 women reported been diagnosed with one of the conditions listed in Question 34, and 35 indicated currently taking medication. However, only 28 of the 68 women diagnosed with a condition listed in Question 34 are receiving treatment. This suggest that 7 women are taking medication for conditions not listed in Question 34, while 40 women with a reported health condition are currently not receiving any treatment (Figures 7 and 8).

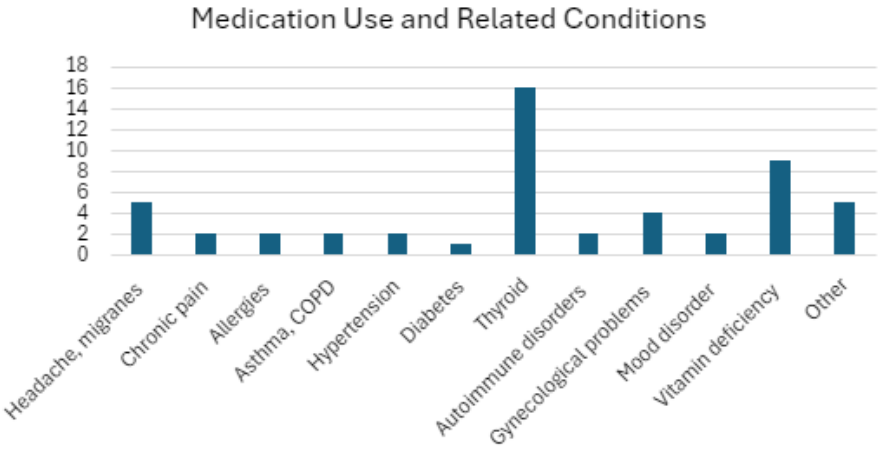

Figure 7. Medication Use and Related Conditions (n = 35). This figure presents the medication use and chronic health conditions among 35 participants who reported using medication. It offers insight into the relationship between self-reported health and actual health status, showing that despite perceptions of good health, some respondents disclosed using medication for chronic health conditions.

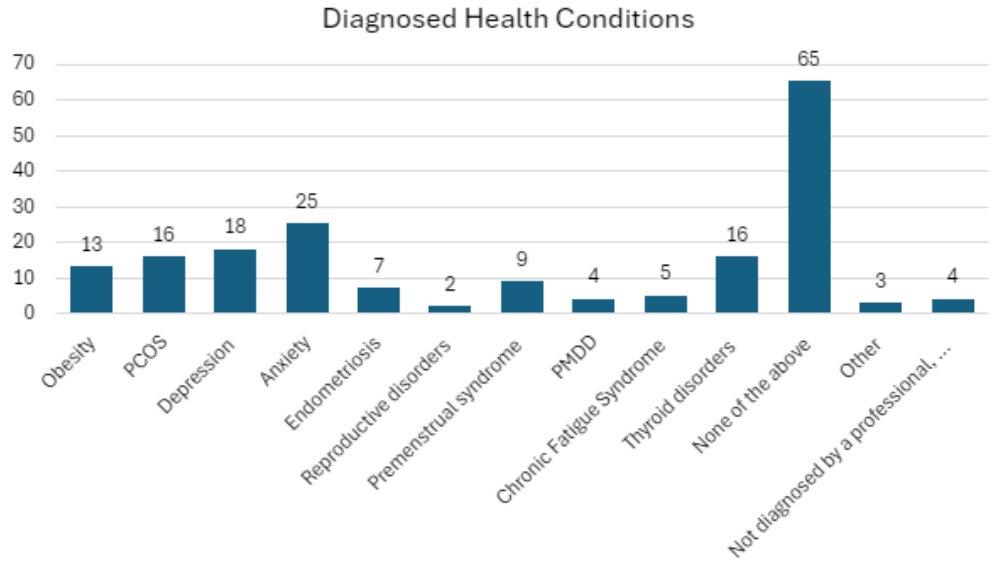

Figure 8. Diagnosed Health Conditions (n = 187). This figure shows the range of diagnosed health conditions reported by participants. A total of 187 conditions were reported across the participants, providing further context for the self-reported health status and BMI discrepancies observed in the study.

Over half of the participants reported that they do not regularly engage in exercise, yoga, meditation, or prayers (figures 9 and 10). This observed inconsistency between self-reported health perceptions, objective health indicators, and lifestyle practices highlights the complexity of women's health issues, emphasizing the need for further research into the underlying factors contributing to these discrepancies. Such findings highlight the critical need for advancing health education and awareness initiatives to bridge the gap between self-perceived and actual health status among women and encourage the adoption of health-promoting behaviours.

The impact of exercise, yoga and meditation on the psychological symptoms was statistically compared. The practice of exercise had a statistically significant effect on anxiety levels, with women who did not exercise more likely to experience anxiety ($p = 0.0027$). Specifically, women who did not engage in exercise were more likely to report experiencing anxiety. In addition, women who did not practice yoga, meditation or prayers were more likely to experience feelings of breathlessness ($p = 0.013$) and were more likely to have been diagnosed with PMS ($p = 0.042$). These results are summarized in tables 2 and 3.

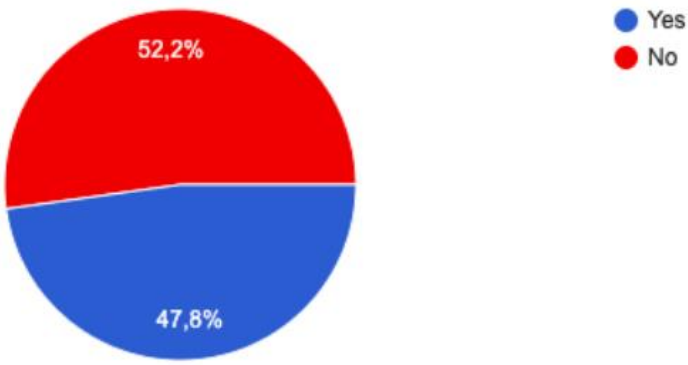

Figure 9. Exercise Habits of Participants (n = 136). This figure shows the exercise habits of participants. Over half of the respondents (52.2%) reported not regularly engaging in exercise.

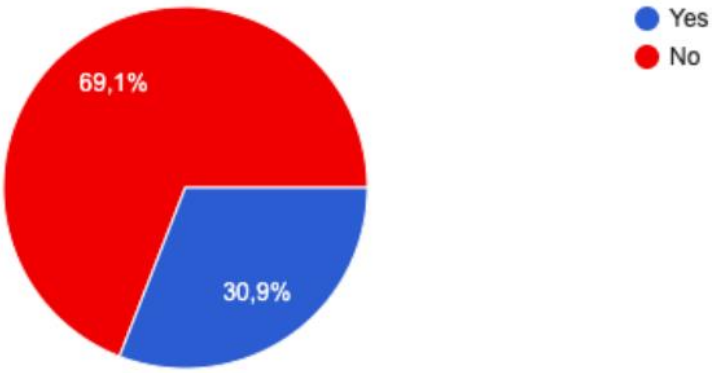

Figure 10. Practice of Yoga, Meditation, or Prayers (n = 136). This figure presents the practice of yoga, meditation, or prayers among participants. 94 out of 136 (69.11%) respondents reported not practicing any of these activities regularly.

Table 2. Effect of Exercise on Psychological Symptoms and Health Conditions (n=136)

Exercise	Yes	No	P value
Psychological Symtoms			
Mood swings	54/65	59/71	1
Highly sensitive and emotional	49/65	57/71	0.63
Excessive food cravings	37/65	43/71	0.8
Loss of appetite	13/65	19/71	0.47
Breathlessness	3/65	1/71	0.35
Does not experience any of these symptoms	0/65	0/71	-
Health Conditions			
Depression	6/65	12/71	0.29
Anxiety	3/65	16/71	0.0027
Premenstrual Dysphoric Disorder	1/65	3/71	0.62
PMS	5/65	4/71	0.74

This table examines the impact of exercise on psychological symptoms and certain health conditions, including PMS and PMDD. Among the 136 responses, 65 participants exercise regularly, while 71 do not. Statistically, exercise was found to have a significant effect on anxiety.

Table 3. Effect of Yoga, Meditation, or Prayers on Psychological Symptoms and Health Conditions (n=136)

Yoga, Meditation or Prayers	Yes	No	P value
Psychological Symptoms			
Mood swings	36/42	78/94	0.882
Highly sensitive and emotional	36/42	75/94	0.559
Excessive food cravings	28/42	52/94	0.292
Loss of appetite	13/42	19/94	0.252
Breathlessness	4/42	0/94	0.013
Does not experience any of these symptoms	0/42	0/94	-
Health Conditions			
Depression	6/42	12/94	1
Anxiety	10/42	15/94	0.394
Premenstrual Dysphoric Disorder	3/42	1/94	0.165
PMS	6/42	3/94	0.042

This table explores the effect of yoga, meditation, and prayers on psychological symptoms and conditions like PMS and PMDD. Of the 136 responses, 42 participants practice these activities, while 94 do not. Notably, practicing yoga, meditation, or prayers was associated with a reduced likelihood of experiencing breathlessness and having been diagnosed with PMS.

The findings related to the menstrual cycle provide insights into age of menarche, cycle regularity, and perceived flow intensity. The majority of women (58.1%) reported experiencing their first period predominantly between the ages of 13 and 15, as illustrated in Figure 11. Further analysis explored the frequency of menstruation among those with irregular cycles. Of the 136 respondents, 22 women reported experiencing irregular cycles, with considerable variations ranging from every 2–3 weeks (approximately twice per month) to occurrences as infrequent as once every 3–4 months per year (Figures 12–13). Most women described their menstrual flow as "moderate" (Figure 14). However, it is important to note that the classification of menstrual flow intensity (light, moderate, or heavy) remains subjective and may vary between individuals. This subjectivity highlights a critical need for comprehensive menstrual health education to establish clear and standardized parameters in assessing menstrual patterns. The apparent lack of knowledge among women regarding typical menstrual experiences highlights a significant gap in reproductive health literacy, emphasizing the necessity for enhanced menstrual health education and awareness.

An in-depth examination of the relationship between menstrual cycle irregularity and health conditions among the women who participated in this study revealed important findings. Participants with irregular cycles, i.e. shorter than 21 days or longer than 35 days, indicate the experience of additional health concerns. Upon further analysis, responses were categorized based on their consistency with the regularity of menstrual cycles.

Interestingly, two women who reported their cycles as "regular" indicated that their cycles occurred every 15-21 days (every 2–3 weeks), while the other reported a cycle occurring every two months. After excluding these two responses from the analysis, the remaining data indicated that 20 women had irregular menstrual cycles. Among these 20 women, 14 reported having at least one diagnosed health condition, as outlined in table 4. These health conditions, which include PMS, PMDD, depression, and anxiety, are commonly associated with menstrual cycle irregularities.

A notable relationship was found between irregular menstrual cycles and an increased likelihood of experiencing health conditions such as PMS, PMDD, and anxiety, along with other psychological and physical symptoms. These findings suggest that irregular menstrual cycles may be associated with certain health concerns, though further research is needed to explore the potential causal relationships.

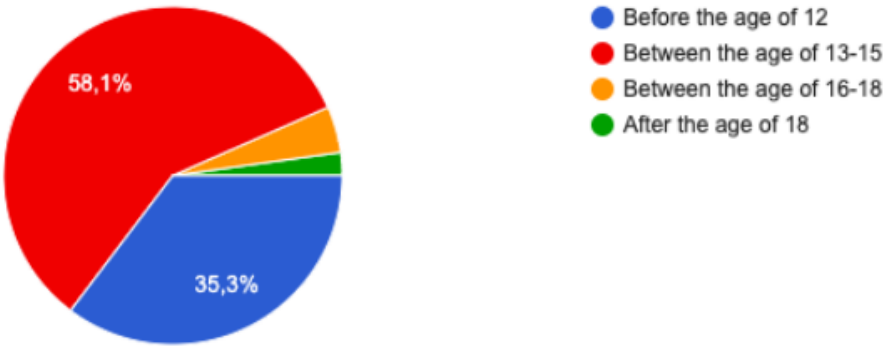

Figure 11. Age at Menarche (n = 136). This figure illustrates the age at which participants experienced menarche. The majority of women (58.1%) reported that their first period occurred between the ages of 13 and 15.

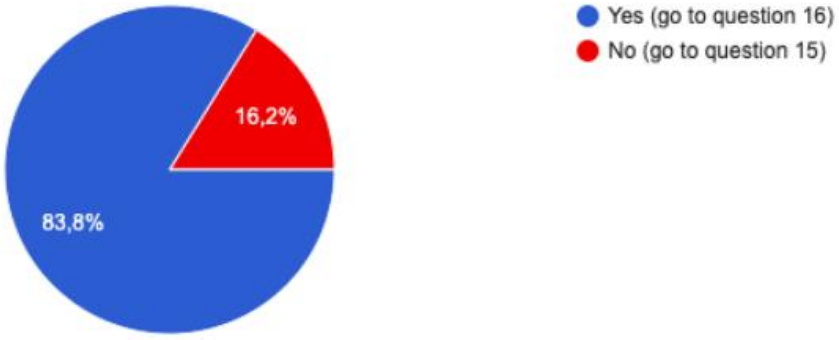

Figure 12. Regularity of Menstrual Cycles (n = 136). This figure highlights the variations in cycle regularity among participants, with 16.2% of women reporting irregular cycles.

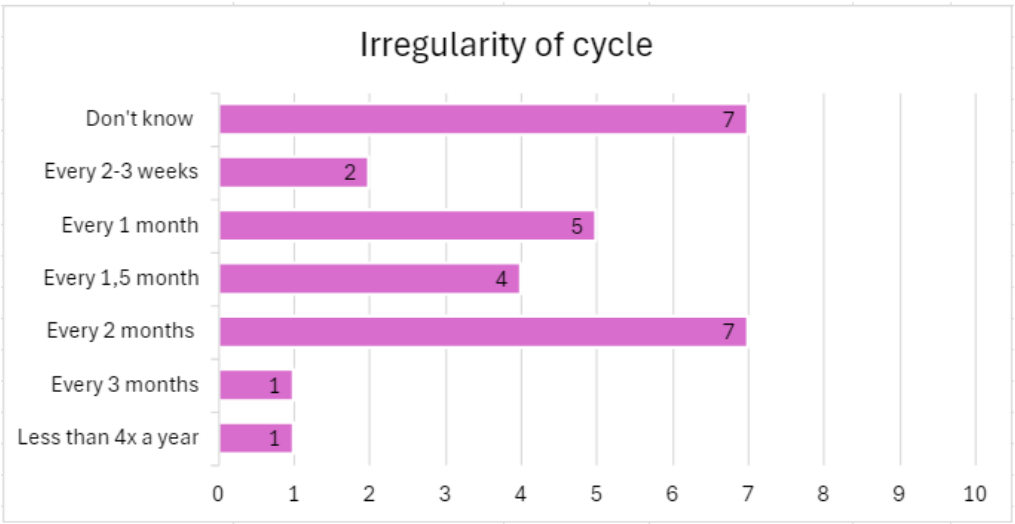

Figure 13. Frequency of Menstruation per Year Among Participants with Irregular Cycles (n = 27). This figure presents the frequency of menstruation per year among 27 participants who responded to the question about irregular cycles, despite having the option to skip if they had regular cycles. Of the 27 women, 22 reported irregular cycles, with 7 uncertain about their cycle frequency. Among the 15 women who provided details, responses varied widely, from cycles occurring every 2–3 weeks to as infrequent as once every 3–4 months or fewer than 4 times per year.

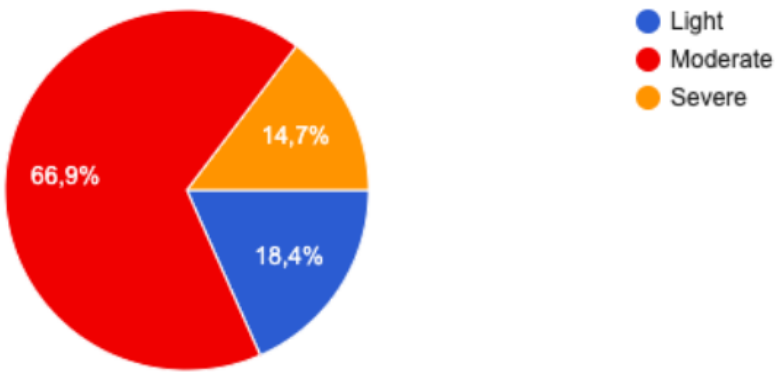

Figure 14. Menstrual Flow Intensity (n = 136). This figure shows the perceived intensity of menstrual flow among participants. Most women reported experiencing moderate flow (66.9%), though the classification of flow intensity is subjective and may vary between individuals.

Table 4. Relationship Between Menstrual Cycle Irregularity and Reported Health Conditions.

Cycle Regularity	Number of Respondents (N)	Percentage of Total (%)	Reported Health Conditions
Total Respondents	136	100%	Asthma, Autoimmune disorders, Anxiety, Chronic Fatigue Syndrome, Depression, Diabetes, Endometriosis, Migraines, Obesity, PMS, PMDD, PCOS, Vitamin deficiency, Thyroid, Mood disorders, Gynaecological and Reproductive Disorders
Total reported Health Conditions	79	58.1%	
Women with Regular Cycles	114	83.8%	Asthma, Autoimmune diseases, Anxiety, Depression, Endometriosis, Chronic Fatigue Syndrome, PCOS, PMDD, PMS, Obesity, Vitamin deficiency, Thyroid Disorders, Other
Women with Irregular Cycles	22	16.2%	Anxiety, Depression, Thyroid Disorders, Endometriosis, Chronic Fatigue Syndrome, Hypertension, PCOS, PMDD, PMS, Obesity, Reproductive and Gynaecological conditions, Other
Excluding Special Cases (Irregular Cycles)	20	14.7%	
Irregular Cycles with Health Conditions	14	10.3%	

This table presents the relationship between menstrual cycle irregularity and reported health conditions among participants. It highlights the association between irregular cycles and specific health conditions. After excluding cases where cycles were reported as "regular" despite occurring every 15–21 days or every two months, 20 women with irregular cycles were analysed, 14 of whom reported at least one diagnosed health condition.

In relation to the symptoms experienced during the menstrual cycle, participants were asked to report both physical symptoms, such as headaches, leg and back pain, and abdominal discomfort, as well as behavioural and psychological symptoms, including low mood, changes in appetite, sensitivity, and emotional fluctuations (Table 5). Additionally, participants were asked to specify the timing of these symptoms (Figure 15), whether they occurred during the week prior to bleeding, during the week of menstruation itself, or outside of these periods during times when bleeding was absent. This question aimed to determine whether the symptoms were linked to the menstrual cycle or occurred independently. Furthermore, participants were asked whether they experienced these symptoms regularly (Figure 16), with response options indicating frequency such as "every month before or during menstruation," "often," "a few times," or "irregularly."

Among the respondents, 52.6% reported experiencing symptoms outside of their menstrual period. Additionally, 43% indicated they experienced these symptoms on a regular basis, while 33.3% reported experiencing them every month.

It is essential to assess the impact of these symptoms on women's daily lives and activities. The survey included questions that asked participants to describe how their symptoms affected their ability to perform daily tasks (Figures 17 and 18). Among the responses, 43 participants reported experiencing low motivation throughout the day, 12 noted that severe pain impaired their work, 16 stated they could still complete some tasks but with difficulty, and 10 mentioned struggling to maintain focus on their work. While 66.2% of the 136 respondents indicated that the symptoms impacted their daily activities, only 94 participants answered to question 23.

Table 5. Physical and Psychological Symptoms Experienced During the Menstrual Cycle (n = 136).

Physical Symptoms	**Frequency**	**Psychological Symptoms**	**Frequency**
Abdominal pain	104	Mood swings	114
Headache	53	Excessive food cravings	80
Back pain	80	Loss of appetite	32
Leg pain	34	Highly sensitive and emotional	111
Painful/swollen breasts	72	Breathlessness	4
Fatigue	99		

This table presents the frequencies of physical and psychological symptoms experienced by participants during their menstrual cycle.

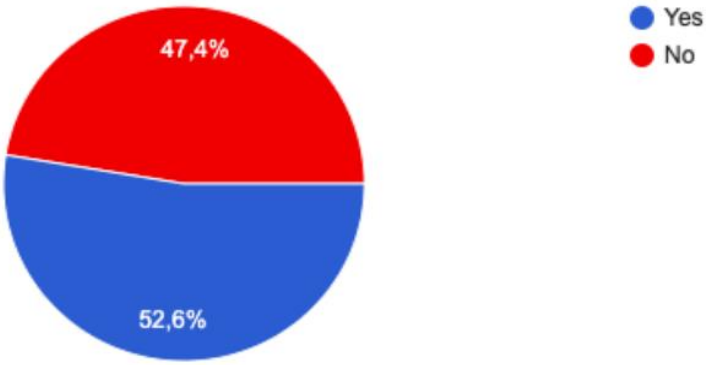

Figure 15. Experience of Symptoms Outside the Menstrual Cycle (n = 135). This figure shows the frequency of psychological and physical symptoms reported by participants as occurring outside of their menstrual cycle. Over half (52.6%) of respondents reported experiencing symptoms outside of their menstrual period.

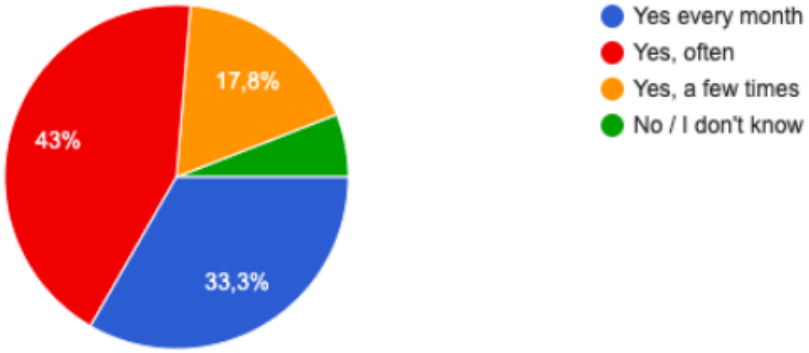

Figure 16. Experience of Symptoms in Relation to the Menstrual Cycle (n = 135). This figure shows how frequently participants experience psychological and physical symptoms in relation to their menstrual cycle. The majority of respondents (43%) reported experiencing symptoms on a regular basis, while 33.3% indicated they experience symptoms every month, either before or during menstruation.

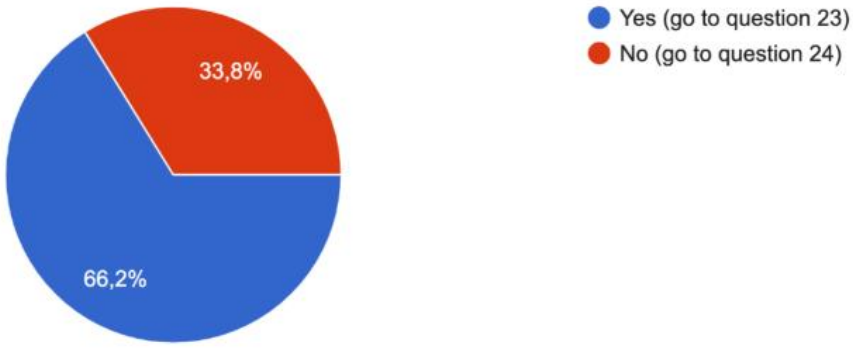

Figure 17. Impact of Menstrual Symptoms on Daily Activities (n = 136). This figure presents the impact of menstrual symptoms on daily activities, with 66.2% of respondents reporting that their symptoms affect their ability to perform daily tasks.

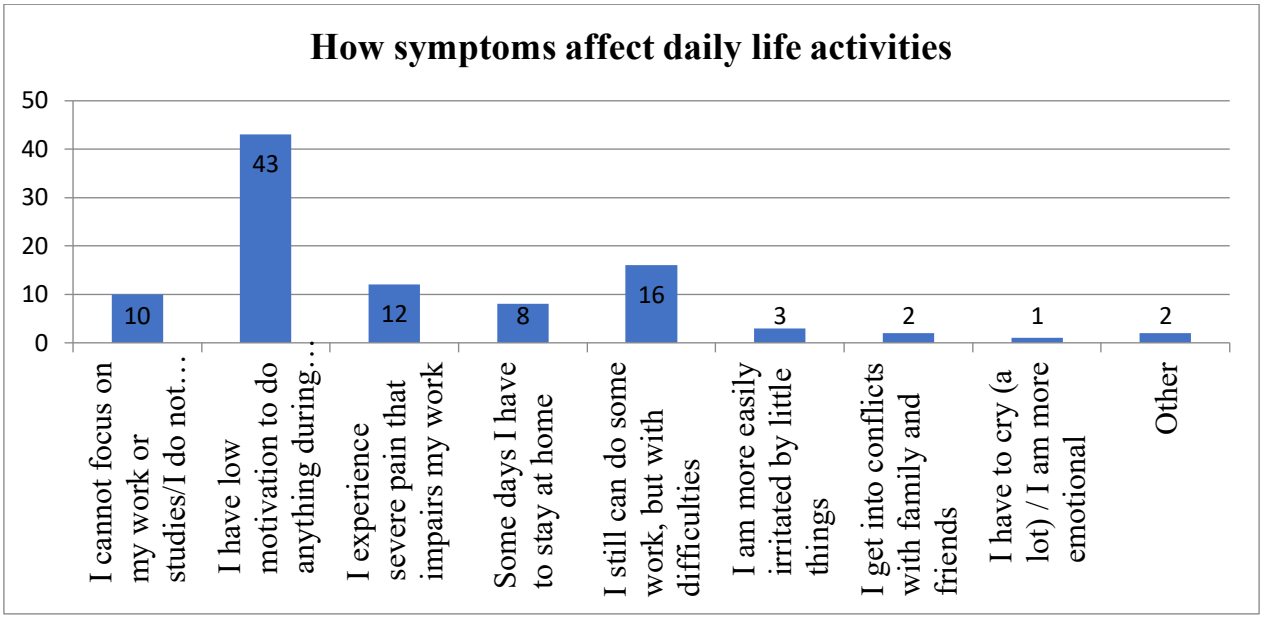

Figure 18. Impact of Menstrual Symptoms on Life (n = 94). This figure illustrates the effect of menstrual symptoms on participants' daily life, with responses highlighting issues such as experiencing severe pain that impairs work, low motivation, difficulty completing tasks, and challenges maintaining focus.

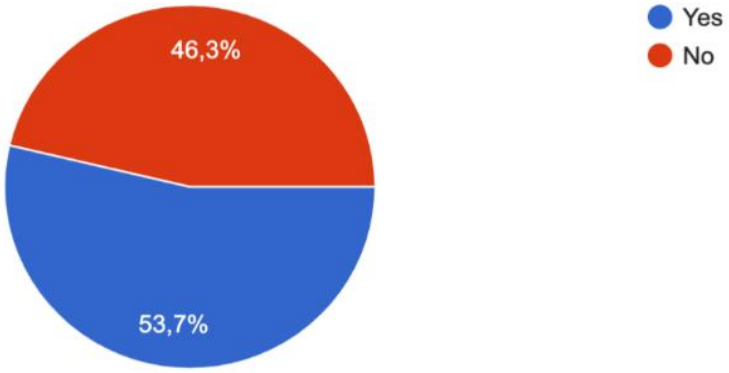

Figure 19. Internet Searches for Menstrual Symptoms (n = 136). This figure shows the number of respondents who searched for information about their menstrual symptoms online.

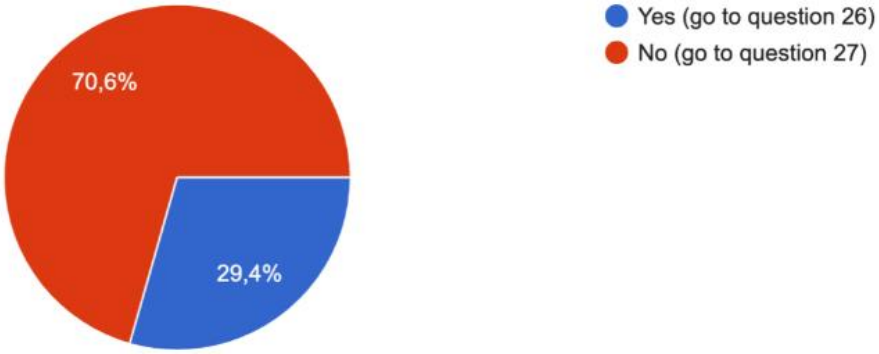

Figure 20. Doctor Visits Regarding Menstrual Symptoms (n = 136). This figure shows the number of participants who sought medical advice for their menstrual symptoms.

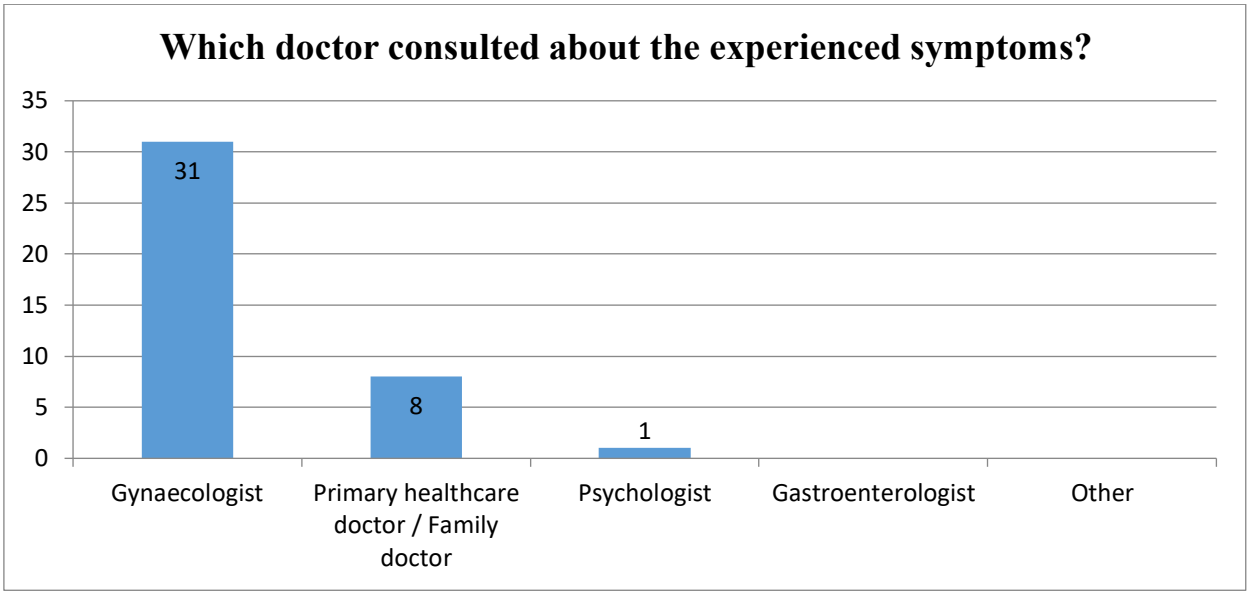

Figure 21. Type of Doctor Consulted for Experienced Symptoms (n = 40). This figure illustrates the types of medical professionals participants consulted regarding their menstrual symptoms.

Surprisingly, despite 53.7% of respondents reporting that they searched for information about their symptoms online, 70.6% indicated they had not sought medical consultation for their symptoms (Figures 19 and 20). Among those who reported visiting a healthcare provider, 31 consulted a gynaecologist, 8 visited a family doctor, and 1 sought help from a psychologist (Figure 21).

Question 11 asked participants about medication use for various health conditions, including headaches or migraines, chronic pain, allergies, asthma or COPD, hypertension, diabetes, thyroid conditions, autoimmune disorders, gynaecological conditions, mood disorders, vitamin deficiency, and others. For each of these 11 conditions, statistical analyses were conducted to determine whether there is a relationship between having a specific condition and the experience of specific physical and psychological symptoms. The results, along with p-values for each symptom, are depicted in the tables below.

Results of the conducted survey reveal a statistically significant relationship between having headaches or migraines and the experience of painful/swollen breasts ($p < 0.0001$) and excessive food cravings ($p = 0.0054$) during PMS, as shown in Table 6. Similarly, a significant relationship was found between chronic pain and painful/swollen breasts ($p < 0.0001$) and excessive food cravings ($p = 0.045$) during PMS, with no significant associations for other symptoms. These findings are detailed in Table 7.

Table 6. Headache/Migraine and Its Relation to the Physical and Psychological Symptoms (n = 35).

	No condition	Headache/migraine	P value
Physical Symptoms			
Headache	36/101	4/5	0.127
Abdominal pain	77/101	4/5	1
Back pain	56/101	5/5	0.133
Leg pain	25/101	1/5	1
Painful/swollen breasts	4/101	4/5	<0.0001
Fatigue	58/101	3/5	1
I don't experience any of these symptoms	0/101	0/5	1
Psychological Symptoms			
Mood swings	82/101	5/5	0.636
Highly sensitive and emotional	80/101	4/5	1
Excessive food cravings	18/101	4/5	0.0054
Loss of appetite	25/101	2/5	0.812
Breathlessness	1/101	1/5	0.172
Does not experience any of these symptoms	0/101	0/5	1

This table illustrates the relationship between having headaches/migraines and experiencing physical and psychological symptoms during the menstrual cycle. Among 35 responses, five women reported taking medication for headaches or migraines, whereas 101 participants did not experience headaches or migraines.

Table 7. Chronic Pain and Its Relation to Physical and Psychological Symptoms (n = 35).

	No condition	Chronic pain	P value
Physical Symptoms			
Headache	36/101	1/2	1
Abdominal pain	77/101	1/2	0.981
Back pain	56/101	2/2	0.590
Leg pain	25/101	1/2	1
Painful/swollen breasts	4/101	2/2	<0.0001
Fatigue	68/101	1/2	1
I don't experience any of these symptoms	0/101	0/2	1
Psychological Symptoms			
Mood swings	82/101	2/2	1
Highly sensitive and emotional	80/101	2/2	1
Excessive food cravings	18/101	2/2	0.045

Table 7 (*continued*). Chronic Pain and Its Relation to Physical and Psychological Symptoms (n = 35).

	No condition	Chronic pain	P value
Psychological Symptoms			
Loss of appetite	25/101	0/2	1
Breathlessness	1/101	0/2	1
Does not experience any of these symptoms	0/101	0/5	1

This table illustrates the relationship between chronic pain health condition and the experience of physical and psychological symptoms during the menstrual cycle. Only 2 women out of 35 respondents reported taking medication for chronic pain.

Regarding allergies, results show a statistically significant relationship as well between allergies and painful/swollen breasts ($p = 0.036$) during PMS, but no significant association was observed with other symptoms. Only one participant with allergies was included in the analysis due to an incorrectly completed questionnaire. The results are shown in Table 8.

None of the listed symptoms showed a statistically significant relationship with having asthma or COPD (all p-values > 0.05) during PMS. The results are exhibited in Table 9, which explores the correlation between asthma/COPD and the experience of physical and psychological symptoms during the menstrual cycle. Similarly, no statistically significant association was found between hypertension and the listed symptoms (all p-values > 0.05) during PMS, as illustrated in Table 10.

However, there was a statistically significant relationship found between having diabetes and experiencing painful/swollen breasts (p-value = 0.036) during PMS, which is detailed in Table 11. In addition, having a thyroid condition was significantly associated with experiencing painful/swollen breasts ($p < 0.0001$) during PMS. A total of 16 women reported having a thyroid condition, but only 7 were included in the statistical analysis due to incomplete questionnaires, as shown in Table 12.

Furthermore, autoimmune disorders were found to be statistically significantly related to both painful/swollen breasts ($p = 0.049$) and breathlessness ($p = 0.020$) during PMS. Out of the two women with autoimmune disorders, only one was included in the analysis due to incorrectly completed questionnaires. These results are summarized in Table 13.

Table 8. Allergies and Their Relation to Physical and Psychological Symptoms (n = 35).

	No condition	Allergies	P value
Physical Symptoms			
Headache	36/101	1/1	0.774
Abdominal pain	77/101	1/1	1
Back pain	56/101	1/1	1
Leg pain	25/101	1/1	1
Painful/swollen breasts	4/101	1/1	0.036
Fatigue	68/101	1/1	0.204
I don't experience any of these symptoms	0/101	0/1	1
Psychological Symptoms			
Mood swings	82/101	1/1	1
Highly sensitive and emotional	80/101	1/1	1
Excessive food cravings	18/101	1/1	0.418
Loss of appetite	25/101	0/1	1
Breathlessness	1/101	0/1	1
Does not experience any of these symptoms	0/101	0/1	1

This table presents the association between allergies and the physical and psychological symptoms. Only 1 participant out of the 35 responses reported taking medication for allergies.

Table 9. Asthma/COPD and Its Relation to Physical and Psychological Symptoms (n = 35).

	No condition	Asthma/COPD	P value
Physical Symptoms			
Headache	36/101	2/2	0.259
Abdominal pain	77/101	2/2	1
Back pain	56/101	1/2	1
Leg pain	25/101	1/2	1
Painful/swollen breasts	4/101	0/2	1
Fatigue	68/101	2/2	0.829
I don't experience any of these symptoms	0/101	0/2	1
Psychological Symptoms			
Mood swings	82/101	2/2	1
Highly sensitive and emotional	80/101	2/2	1
Excessive food cravings	18/101	1/2	0.809
Loss of appetite	25/101	1/2	1
Breathlessness	1/101	0/2	1
Does not experience any of these symptoms	0/101	0/2	1

This table shows the relationship between asthma/COPD and the physical and psychological symptoms experienced during the menstrual cycle. Two women reported taking medication for asthma/COPD.

Table 10. Hypertension and Its Relation to Physical and Psychological Symptoms (n = 35)

	No condition	Hypertension	P value
Physical Symptoms			
Headache	36/101	0/2	0.766
Abdominal pain	77/101	1/2	0.981
Back pain	56/101	0/2	0.400
Leg pain	25/101	0/2	1
Painful/swollen breasts	4/101	2/2	0.259
Fatigue	68/101	2/2	0.829
I don't experience any of these symptoms	0/101	0/2	1
Psychological Symptoms			
Mood swings	82/101	1/2	0.840
Highly sensitive and emotional	80/101	2/2	1
Excessive food cravings	18/101	1/2	0.809
Loss of appetite	25/101	0/2	1
Breathlessness	1/101	0/2	1
Does not experience any of these symptoms	0/101	0/2	1

This table examines the correlation between hypertension and the experience of physical and psychological symptoms during the menstrual cycle. Two women out of the 35 responses reported taking medication for hypertension.

Table 11. Diabetes and Its Relation to Physical and Psychological Symptoms (n = 35)

	No condition	Diabetes	P value
Physical Symptoms			
Headache	36/101	0/1	1
Abdominal pain	77/101	0/1	0.551
Back pain	56/101	0/1	0.921
Leg pain	25/101	0/1	1
Painful/swollen breasts	4/101	1/1	0.036
Fatigue	68/101	1/1	1
I don't experience any of these symptoms	0/101	0/1	1
Psychological Symptoms			
Mood swings	82/101	0/1	0.442
Highly sensitive and emotional	80/101	1/1	1
Excessive food cravings	18/101	1/1	0.418

Table 11 (*continued*). Diabetes and Its Relation to Physical and Psychological Symptoms (n = 35)

	No condition	Diabetes	P value
Psychological Symptoms			
Loss of appetite	25/101	0/1	1
Breathlessness	1/101	0/1	1
Does not experience any of these symptoms	0/101	0/1	1

This table demonstrates the relationship between diabetes and the experience of physical and psychological symptoms during the menstrual cycle. Solely 1 woman reported taking medication for diabetes.

Table 12. Thyroid Conditions and Their Relation to Physical and Psychological Symptoms (n = 35)

	No condition	Thyroid	P value
Physical Symptoms			
Headache	36/101	5/7	0.138
Abdominal pain	77/101	5/7	1
Back pain	56/101	5/7	0.667
Leg pain	25/101	0/7	0.299
Painful/swollen breasts	4/101	6/7	< 0.0001
Fatigue	68/101	7/7	0.164
I don't experience any of these symptoms	0/101	0/7	1
Psychological Symptoms			
Mood swings	82/101	7/7	0.453
Highly sensitive and emotional	80/101	7/7	0.395
Excessive food cravings	18/101	3/7	0.261
Loss of appetite	25/101	1/7	0.866
Breathlessness	1/101	1/7	0.283
Does not experience any of these symptoms	0/101	0/1	1

This table outlines the relationship between thyroid disorders and the experience of physical and psychological symptoms during the menstrual cycle. Seven women reported taking medication for thyroid disorders.

Table 13. Autoimmune Disorders and Their Relation to Physical and Psychological Symptoms (n=35)

	No condition	Autoimmune disorders	P value
Physical Symptoms			
Headache	36/101	0/1	0.363
Abdominal pain	77/101	1/1	1
Back pain	56/101	1/1	1
Leg pain	25/101	1/1	0.255

Table 13 (*continued*). Autoimmune Disorders and Their Relation to Physical and Psychological Symptoms

	No condition	Autoimmune disorders	P value
Physical Symptoms			
Painful/swollen breasts	4/101	0/1	0.049
Fatigue	68/101	1/1	1
I don't experience any of these symptoms	0/101	0/1	1
Psychological Symptoms			
Mood swings	82/101	1/1	1
Highly sensitive and emotional	80/101	1/1	1
Excessive food cravings	18/101	0/1	0.186
Loss of appetite	25/101	1/1	0.255
Breathlessness	1/101	0/1	0.020
Does not experience any of these symptoms	0/101	0/1	1

This table shows the relationship between autoimmune disorders and the experience of physical and psychological symptoms during the menstrual cycle. Only 1 participant reported taking medication for an autoimmune disorder.

Table 14. Gynaecological Conditions and Their Relation to Menstrual Symptoms (n = 35)

	No condition	Gynaecological conditions	P value
Physical Symptoms			
Headache	36/101	2/5	1
Abdominal pain	77/101	3/5	0.771
Back pain	56/101	5/5	0.133
Leg pain	25/101	2/5	0.812
Painful/swollen breasts	4/101	4/5	<0.0001
Fatigue	68/101	4/5	0.919
I don't experience any of these symptoms	0/101	0/5	1
Psychological Symptoms			
Mood swings	82/101	5/5	0.636
Highly sensitive and emotional	80/101	3/5	0.645
Excessive food cravings	18/101	4/5	0.005
Loss of appetite	25/101	1/5	1
Breathlessness	1/101	0/5	1
Does not experience any of these symptoms	0/101	0/1	1

This table outlines the association between gynaecological issues and the experience of physical and psychological symptoms during the menstrual cycle. Five women reported using medication for gynaecological conditions.

Statistically significant relationships were observed between gynaecological conditions and the experience of painful/swollen breasts ($p < 0.0001$) and excessive food cravings ($p = 0.005$) during PMS, as shown in Table 14. Similarly, women with mood disorders exhibited a significant relationship with painful/swollen breasts (p-value < 0.001) during PMS, with results presented in Table 15. Additionally, a significant association was found between vitamin deficiencies and multiple symptoms, including excessive food cravings (p-value = 0.003), breathlessness ($p<0.0001$), and painful/swollen breasts ($p < 0.0001$) during PMS (Table 16).

To assess the statistical significance of possessing a body mass index (BMI) on the experience of the physical and psychological symptoms during PMS, participants were given the option self-report their BMI in question 7 of the survey. Statistical analyses were conducted to determine if there exists a significant association between specific BMI categories and the manifestation of physical symptoms and psychological symptoms during PMS. For this analysis, BMI was categorized into two groups: healthy (ranging from 18 to 25 kg/m^2) and unhealthy (a BMI either lower than 18 kg/m^2 or greater than 25 kg/m^2), in accordance with the World Health Organization's (WHO) BMI classification system (43). A statistically significant relationship between BMI and experiencing loss of appetite ($p = 0.026$) was identified. Other symptoms did not exhibit a statistically significant relationship with BMI status. The results are outlined in Table 17.

Question 13 distinguished participants by their menarche age: before the age of 12, between the age of 13-15, between the age of 16-18 and after the age of 18. Responses were divided into two groups of age of menarche, namely before 15 years old and after 15 years old. Statistical analysis was made to determine whether the age of menarche has an impact on the symptoms experienced during PMS. Table 18 presents the relation of the symptoms women experience during their menstrual cycle in relation to the age of menarche. Most commonly experienced symptoms are abdominal cramps, being highly sensitive and emotional, and having mood swings. However, these did not present a statistical significant difference between the 2 groups. A statistically significant relationship was found between having food cravings and the age of menarche ($p<0.001$) – i.e. the earlier the menarche, the more it is likely to have food cravings. The results are listed in Table 18.

The severity of menstrual cycle and the age of menarche was also statistically analysed whether the younger or older age of the menarche leads to heavier menstrual cycle. Menstrual cycle was described in question 17 in three variants: light, moderate or severe. The age was distinguished into two groups: the start of menarche before the age of 12 (early) and after the age of 16 (late). There is

a statistically significant relationship between the age of first period and the severity of the menstrual cycle ($p = 0.0128$). Women who started their period before age 12 are more likely to have a moderate menstrual cycle, whereas women who started after age 16 show a different distribution across severities. The results are listed in the Tables 19 and 20.

Table 15. Mood Disorders and Their Relation to Menstrual Symptoms (n = 35)

	No condition	Mood disorders	P value
Physical Symptoms			
Headache	36/101	2/4	0.956
Abdominal pain	77/101	3/4	1
Back pain	56/101	2/4	1
Leg pain	25/101	1/4	1
Painful/swollen breasts	4/101	4/4	<0.001
Fatigue	68/101	3/4	1
I don't experience any of these symptoms	0/101	0/4	-
Psychological Symptoms			
Mood swings	82/101	4/4	0.767
Highly sensitive and emotional	80/101	4/4	0.702
Excessive food cravings	18/101	2/4	0.338
Loss of appetite	25/101	1/4	1
Breathlessness	1/101	0/4	1
Does not experience any of these symptoms	0/101	0/4	-

This table highlights the connection between mood disorders and the occurrence of physical and psychological symptoms during the menstrual cycle. Four women reported taking medication for mood disorders.

Table 16. Vitamin Deficiency and Its Relation to Menstrual Symptoms (n = 35)

	No condition	Vitamin deficiency	P value
Physical Symptoms			
Headache	36/101	4/9	0.869
Abdominal pain	77/101	5/9	0.334
Back pain	56/101	6/9	0.764
Leg pain	25/101	3/9	0.867
Painful/swollen breasts	4/101	7/9	<0.0001
Fatigue	68/101	8/9	0.335
I don't experience any of these symptoms	0/101	0/9	

Table 16 (*continued*). Vitamin Deficiency and Its Relation to Menstrual Symptoms (n = 35)

	No condition	Vitamin deficiency	P value
Psychological Symptoms			
Mood swings	82/101	7/9	1
Highly sensitive and emotional	80/101	8/9	0.794
Excessive food cravings	18/101	6/9	0.003
Loss of appetite	25/101	2/9	1
Breathlessness	1/101	3/9	<0.0001
Does not experience any of these symptoms	0/101	0/9	

This table examines the relationship between vitamin deficiency and various physical and psychological symptoms experienced during the menstrual cycle. Nine women reported taking medication for vitamin deficiency.

Table 17. Association Between BMI and Menstrual Symptoms (n =136)

Physical Symptoms		Outside normal range of BMI (<18 or >25)	Normal BMI (18-25)	P value
Headache	53	30/68	23/68	0.291
Abdominal pain	104	54/68	50/68	0.544
Back pain	80	42/68	38/68	0.601
Leg pain	34	16/68	18/68	0.843
Painful swollen breast	72	33/68	39/68	0.390
Fatigue	99	49/68	50/68	1
I don't experience any of these symptoms	1	0/68	1/68	1
Psychological Symptoms				
Mood swings	113	60/68	53/68	0.170
Food cravings	80	44/68	36/68	0.223
Loss of appetite	32	10/68	22/68	0.026
Sensitive and emotional	111	58/68	53/68	0.376
Breathlessness	4	4/68	0/68	0.128
Don't experience any of these symptoms	2	0/68	2/68	0.496

This table explores the link between body mass index (BMI) and the symptoms experienced during the menstrual cycle. Half of the participants had a normal BMI (18-25 kg/m²), whereas the others reported either a higher (40.5%) or lower BMI (9.6%)

Table 18. Symptom Severity and Age of Menarche (n = 136)

Physical Symptoms		Age of Menarche <15	Age of Menarche >15	P value
Headache	53	49/127	4/9	1
Abdominal pain	104	95/127	9/9	0.188
Back pain	80	77/127	3/9	0.209
Leg pain	34	33/127	1/9	0.550
Painful swollen breast	72	70/127	2/9	0.118
Fatigue	99	94/127	5/9	0.415
I don't experience any of these symptoms	1	1/127	0/9	1
Psychological Symptoms				
Mood swings	113	108/127	6/9	0.328
Food cravings	80	80/127	0/9	<0.001
Loss of appetite	32	29/127	3/9	0.756
Sensitive and emotional	111	106/127	5/9	0.100
Breathlessness	4	4/127	0/9	1
Don't experience any of these symptoms	2	2/127	0/9	1
Total	136	127	9	

This table illustrates how the age at which participants experienced menarche relates to the severity of menstrual cycle symptoms. A majority of the participants (127 women) reported their first menstrual cycle at or before age 15, while only 9 participants began menstruating after age 15.

Table 19. Impact of Early Menarche (Before Age 12) on the Severity of Menstrual Cycle (n = 48)

Light	Moderate	Severe
6/48	36/48	6/48

Table 20. Impact of Late Menarche (After Age 16) on the Severity of Menstrual Cycle (n = 6)

Light	Moderate	Severe
3/6	1/6	2/6

To explore the impact of trauma or stressful life events on menstrual symptoms, participants were asked about their history of trauma (Figure 22). Statistical analysis was then performed to determine whether women with a history of trauma or stress experience more symptoms during their cycle. The responses from questions 18, 19, and 31 were analysed. Results showed statistically significant relationships between trauma and symptoms such as headache ($p = 0.040$), fatigue ($p = 0.012$),

mood swings (p = 0.012), and excessive food cravings (p = 0.045), indicating that women with a history of trauma are more likely to experience these symptoms during their cycle compared to those without a history of trauma or stressful events.

Among the psychological symptoms, mood swings were the most significant, with 91.5% of respondents with trauma reporting them, compared to 73.8% of those without a history of trauma. Additionally, being highly sensitive and emotional is relatively more common in women who reported going through a trauma or stressful event, reported by 87.3%, compared to 76.9% of those without. These findings underscore the psychological impact trauma or stressful events may have on menstrual symptom experience. The results are listed in the Table 21.

Figures 23 and 24 provide insights into the presence and frequency of low energy and lack of motivation in the participants. When asked if they had experienced low energy and no motivation (Figure 23), a significant majority (92%) of women responded affirmatively. Regarding the regularity of these symptoms (Figure 24), nearly half of the respondents (48%) stated they experienced them every month, while others reported more seasonal occurrences or occasional uncertainty. Furthermore, Table 22 illustrates the connection between these symptoms and the diagnosis of PMS. Of the 136 women surveyed, 12 reported experiencing low energy and a lack of motivation every month. Three out of these 12 were diagnosed with PMS, with 11 women in the entire sample diagnosed with a PMD. Statistical analysis revealed a statistically significant association between PMS and the experience of low energy and no motivation (p = 0.0247), suggesting that women diagnosed with PMDs are more likely to experience these symptoms on a regular basis. Results are summarized in Table 22.

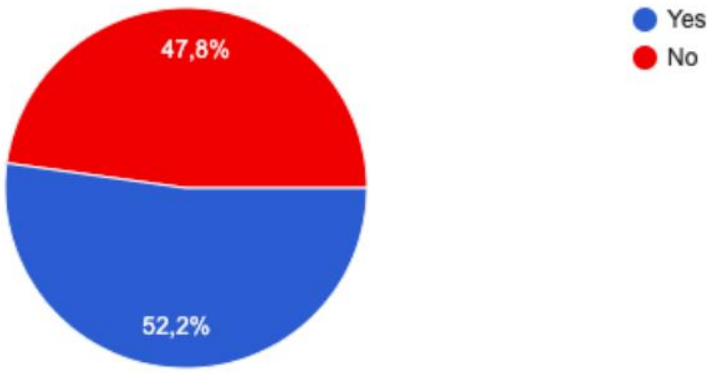

Figure 22. History of Trauma or Stressful Events (n = 136). This figure shows the distribution of responses to the question, "Have you had any history of trauma or a highly stressful event?" Among the 136 responses, 52.2% of participants reported having experienced trauma or a stressful event, while 47.8% reported not having such a history.

Table 21. Effects of Trauma or Stressful Events on Menstrual Symptoms (n =136)

	With trauma or stressful event	No trauma or stressful event	P value
Physical Symptoms			
Headache	34/71	19/65	0.040
Abdominal pain	55/71	49/65	0.934
Back pain	45/71	35/65	0.340
Leg pain	21/71	13/65	0.276
Painful/swollen breasts	42/71	30/65	0.179
Fatigue	61/71	43/65	0.012
I don't experience any of these symptoms	1/71	0/65	1
Psychological Symptoms			
Mood swings	65/71 (91.5%)	48/65 (73.8%)	0.012
Highly sensitive and emotional	62/71 (87.3%)	50/65 (76.9%)	0.173
Excessive food cravings	48/71	32/65	0.045
Loss of appetite	16/71	16/65	0.934
Breathlessness	3/71	1/65	0.620
Does not experience any of these symptoms	1/71	1/65	1

This table outlines the relationship between trauma or stressful life events and the intensity of symptoms experienced during the menstrual cycle. Statistical analysis results show a statistically significant relationship for headache ($p = 0.040$), fatigue ($p = 0.012$), mood swings ($p = 0.012$), and excessive food cravings ($p = 0.045$), indicating that women with a history of trauma are more likely to experience these symptoms during their cycle.

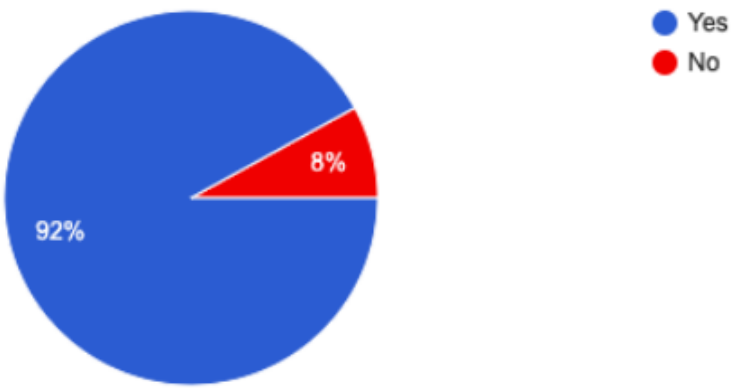

Figure 23. Experience of Low Energy and Lack of Motivation (n = 25). This figure shows the distribution of responses to the question, "Have you had a time in which you had low energy and no motivation?" Among 25 respondents, 23 participants (92%) reported experiencing this, while 2 women (8%) said they do not have such experience.

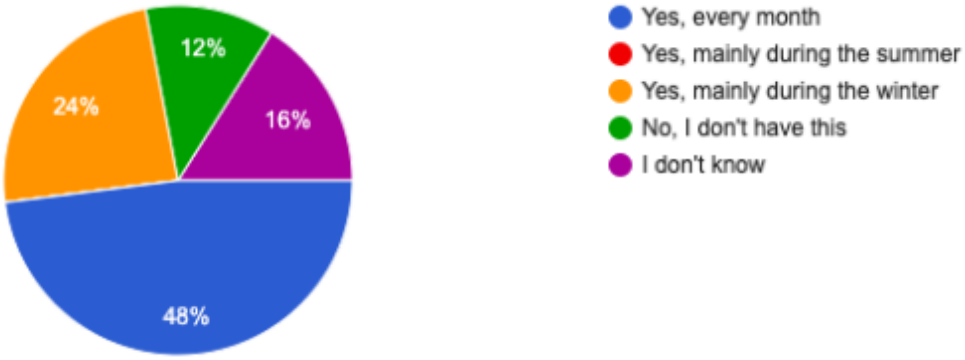

Figure 24. Frequency of Low Energy and Lack of Motivation (n = 25). This figure illustrates the frequency of experiencing low energy and no motivation. Among the respondents, 12 participants (48%) reported experiencing it every month, 6 participants (24%) experience it mainly during winter, 4 women were uncertain (16%), and 3 respondents (12%) said they do not experience it.

Table 22. Low Energy and Lack of Motivation in Women Diagnosed with PMD vs. General Population

	Diagnosed PMD	Not diagnosed PMD	P value
Low energy and no motivation	3/12	9/12	0.0247
General population	11/136	125/136	

This table presents the relationship between experiencing low energy and lack of motivation and being diagnosed with PMS. It shows that 12 women out of 136 reported consistently experiencing low energy and no motivation every month, with 3 of these 12 diagnosed with PMD (including both PMS and PMDD). A statistically significant association was found between PMD diagnosis and the experience of low energy and no motivation ($p = 0.0247$).

As part of the survey, participants were asked about their current methods of managing symptoms (Table 23) as well as their preferences regarding future treatment options (Table 24). Table 23 provides the data on the current management methods of 72 participants who have been diagnosed with a health condition. The table outlines the various approaches women are using, with the majority managing their symptoms through a prescription medication or alternative methods. Table 24 presents the treatment preferences of 24 respondents, detailing their desired approaches for managing symptoms such as mood swings, fatigue, and appetite control. Responses vary from those open to medication to those preferring therapy or no intervention at all.

Lastly, participants were asked about a family history of PMS or mood disorders to examine the potential role genetics may play in the development of these conditions. Specifically, the aim was to explore whether a family history of PMS or mood disorders could contribute to a higher likelihood to be diagnosed with such disorders. Of the 136 participants, 29 reported a family history of PMS or

mood disorders, including anxiety, depression, or other mood-related conditions. As some participants selected more than one option, the total number of responses was 149 (Table 25). Among these 29 women, 13 had been diagnosed with one or more of these conditions, including 7 with mood disorders, 3 with PMS or PMDD, and 3 diagnosed with both a mood disorder and a PMD. The remaining 16 women have a family history of PMS or mood disorders but have not been diagnosed with these conditions themselves. In conclusion, these findings suggest a potential genetic link between family history and the prevalence of PMS and mood disorders.

Table 23. Ways of Managing Symptoms by Women with Health Conditions (n = 72)

Management Methods	Women Reporting This Method	Percentages
Women, who have been prescribed medication	21/72	29.2%
Women, who buy medicine over the counter	13/72	18.1%
Women, who exercise	5/72	6.9%
Women, who take other supplements	13/72	18.1%
Women, who manage in a different way	23/72	31.9%

This table summarizes how women diagnosed with certain conditions (based on results from Question 34) are currently managing their symptoms. The most common methods include pharmaceutical prescription (29.2%) and managing symptoms in other ways (31.9%). A smaller percentage of women do exercise to manage their symptoms (6.9%).

Table 24. Desired Treatment or Management for Symptoms (n = 24)

		Percentages
For Mood swings	2/24	8,3%
For fatigue	3/24	12,5%
For appetite	2/24	8,3%
Remedies	3/24	12,5%
Therapy	4/24	16,7%
No medication	7/24	29,2%
Does not want any kind of care	2/24	8,3%
Other	1/24	4,2%

This table presents the preferences of women regarding the type of treatment or management they would like to pursue for their symptoms. Responses indicate varying preferences, with some women seeking medication, others preferring therapy, and a few opting for remedies outside of medical intervention.

Table 25. Family History of PMS and Mood Disorders Among Participants (n = 136)

Family History of PMS or Mood Disorders	Frequency of Responses	Percentage of the Total (%)
No/I don't know	107	71.8%
Yes, PMS	20	13.4%
Yes, anxiety	7	4.7%
Yes, depression	5	3.4%
Yes, other mood disorders	10	6.7%
Total responses	149	100%

This table presents the number and percentage of women who reported a family history of PMS and mood disorders, with options for PMS, anxiety, depression, and other mood disorders. Since participants were allowed to select multiple options, the total number of responses exceeds the number of participants, with a total of 149 responses from 136 participants.

5. DISCUSSION

This research aimed to explore the impact of premenstrual disorders (PMDs) on women's health and quality of life (QoL). Study findings revealed significant relationships between lifestyle factors, health conditions, and PMD symptoms, but also identified several limitations that must be addressed. This section critically evaluates the findings in light of previous studies and discusses the strengths and weaknesses of this research.

Findings from this research are consistent with existing studies that highlight the profound impact of PMDs on women's quality of life (3). Similar studies have shown that women with PMDs experience a wide range of psychological and physical symptoms, such as mood swings, anxiety, breast pain, and physical pain, all of which compromise their well-being (44). The findings emphasize the debilitating nature of PMDs and their negative effect on daily life. This is in line with Dr. Thomas Reilly's call for greater awareness and training among healthcare professionals to better manage these conditions (11).

Although 66.2% of the participants reported PMD symptoms negatively affecting their daily life, other studies have reported higher percentages. For example the study conducted at Switzerland in 2007 involving 3913 women found that 90% reported their symptoms affected their daily life. Of those, 10.3% had PMS, and 3.1% met the PMDD criteria (45). This suggests that the impact may vary depending on factors such as sample size, diagnostic criteria, or population characteristics. Similarly, in a recent study, Akbulut et al. reported that 80% of women experience mood and physical symptoms related to the menstrual cycle, and 50% report to have problems functioning

effectively at work. However, despite the prevalence and severity of the symptoms and these experiences, only a quarter of women seek professional help (46).

While the sample size of 136 participants is smaller compared to some studies, the results provide valuable insights into the experiences of women with PMDs and mood disorders (47–49). Studies with larger samples have reported similar findings, indicating that the insights gained in this research are meaningful within a broader context. While a larger, more diverse sample would be ideal for making more generalizable conclusions, the current study still offers significant findings that contribute to understanding the prevalence of PMDs.

A notable issue in this study was the discrepancies between self-reported health status and actual health behaviours, such as inconsistencies in responses to questions about cycle regularity, which may compromise the reliability of the data. These inconsistencies could be due to a lack of clarity in the questionnaire design or misunderstanding of the questions by participants. Similar limitations and inconsistencies within study design have been observed in other studies, underscoring that this is a common challenge (13). These discrepancies highlight the challenges in collecting accurate data and reinforce the need for more precise question design and better respondent understanding in future research.

The reliance on self-reported symptoms rather than clinical diagnoses further limits the accuracy in estimating the prevalence rates of PMDs. Research has shown that PMDs are often underdiagnosed, particularly because many women did not seek treatment or report their symptoms to healthcare providers (45,50). For example, despite many participants showing symptoms of PMDs, only 11 out of 136 participants were formally diagnosed. This disparity indicates that diagnostic practices may not adequately capture the full scope of women's experiences, leading to underreporting and misdiagnosis. The true prevalence of PMDs is likely higher than reflected in this study, underlining the need for improved diagnostic accuracy. It also highlights the importance of accessible healthcare and awareness campaigns to ensure that women receive proper diagnoses and treatment for PMDs (45).

As a result, many women developed their own alternative coping mechanisms to manage their symptoms, such as spending time alone as form of self-care or managing symptoms through other means. This aligns with broader trends where women prefer managing their symptoms independently, avoiding formal healthcare support (3). Brown's research noted that in some studies, self-reported diagnoses were accepted, further contributing to the issue of underdiagnosis of PMDs.

Furthermore, many healthcare professionals fail to diagnose PMDs early, as symptoms often overlap with mood disorders, leading to misdiagnosing of conditions like depression or seasonal affective disorder instead of recognizing the link to the menstrual cycle or PMS.

A challenge in this study was the limited ability to follow up with respondents who may have required additional support. Due to the lack of personal contact information and the reluctance among women to seek support or openly discuss their symptoms, it was impossible to reach out to participants who might need professional advice or guidance, particularly if their symptoms were severe, hindering appropriate care. This issue is not unique to the present study, as similar challenges have been observed in other research, such as Cohen et al. (2002), where women were hesitant to document their symptoms prospectively, withdrawing their consent in symptom tracking (49). Some women may have been reluctant to openly discuss their symptoms, especially because of certain cultural backgrounds, further compounded by the stigma surrounding reproductive health issues. This cultural stigma may have resulted in underreporting or reluctance to seek help.

This study suggests that women with a history of trauma or stress experience more intense PMD symptoms. However, due to the lack of specificity in the trauma and stress-related questions, this conclusion is tentative, and these results should be interpreted cautiously. Trauma can vary from physical injury to emotional events, which affect women differently. Without clearly defining the types of trauma or stressful events, it is difficult to assess the true impact of such experiences on PMD symptoms. Previous research by Hantsoo and Epperson confirmed that a history of significant stress exposure is associated with PMDD (51). In a study involving nearly 4000 women, a history of trauma was linked to the diagnosis of PMDD. Similarly, a longitudinal study involving over 3000 women revealed that emotional and physical abuse were strongly associated with moderate to severe PMS symptoms, while sexual abuse showed a weaker correlation. However, some research has not identified a direct connection between abuse and PMDD. It is also important to consider that chronic exposure to stress may interact with genetic factors that predispose individuals to affective disorders, including PMDD, which complicates the interpretation of these findings (51). Further research should refine the complexity and measurement of trauma and stress to better understand how these factors contribute to PMD symptoms, emphasizing the need for more specific and detailed data to establish a clearer understanding.

The potential genetic link between family history and PMDs is supported by several studies, though not conclusive. Family studies suggest that individuals with a family history of PMS may have a genetic predisposition. Research indicates that if a mother experienced PMS, her children are more

likely to develop the condition. Additionally, studies of monozygotic and dizygotic twins show that if one twin has PMS, there is a greater than 40% chance the other twin will develop it as well. Incidence rates among identical twins can be as high as 90% (52). Further studies by Clayton et al. (2022) claim that over 70% of women whose mothers suffered from PMS also experience similar symptoms. However, no specific genotype involved in PMS development has been conclusively identified yet. The presence of familial patterns in studies by Hantsoo and Payne suggest a hereditary factor; however, conclusive evidence for the specific genotype underpinning PMS has not yet been identified (53,54). This study also observed a familial trend, as several participants reported a family history of mood disorders and PMS, pointing to a potential genetic link. Yet, further research is necessary to establish this connection more definitively.

A strength of this study is its comprehensive focus on both physical and psychological symptoms of PMDs, reflecting the multifaceted nature of the condition. This broad approach enables a deeper understanding of how PMDs affect women's quality of life, incorporating factors like lifestyle, health conditions, and psychological well-being. The use of a detailed questionnaire contributed further to the richness of the data collected, offering insights into various aspects of women's health.

However, several limitations were identified that may have impacted the validity and comprehensiveness of the findings and must be acknowledged. Discrepancies in self-reported data, such as misunderstandings or misinterpreting questions, and the questionnaire's lack of clarity and specificity in certain questions, may have led participants to provide inaccurate or incomplete answers, potentially underrepresenting the true prevalence of PMDs. In future studies, more specific questions should be developed to minimize these discrepancies and increase data reliability. The cross-sectional design of this study limits the ability to establish causal relationship. While it provides valuable data, it does not allow for an understanding of how PMDs may develop or change over time. Longitudinal studies would be beneficial for examining deeper insights into the long-term effects of PMDs and their trajectory across different stages of life. Additionally, the study's design and distribution methods may have limited sample diversity. While the online survey format allowed for broad participation, it sometimes resulted in incomplete responses and reducing the specificity and depth as it allowed participants to skip questions. Furthermore, a more proactive recruitment strategy, such as engaging directly with participants and in-person collection, or distributing surveys through university email lists, could have ensured a more diverse and inclusive sample. Moreover, more direct communication with participants could have provided the opportunity to clarify any ambiguous questions and reduce confusion, thus improving data

accuracy. The inability to follow up or directly engage with participants prevented clear, more consistent responses to be obtained, limiting the depth and accuracy of the data and hindering the ability to fully understand participants' experiences. Moving forward, more time should be dedicated to data collection methods and refining survey design, ensuring that questions are clear, detailed, and aligned with the study's goals. This would help improve data reliability and support a higher response rate, ultimately reducing the number of skipped questions.

In summary, while this study provides valuable insights into the prevalence and significant impact of PMDs on women's quality of life, this study has several limitations that should be considered. Discrepancies in self-reported health data, along with the cross-sectional study design, hinder the ability to fully capture the complexity of PMDs. Furthermore, issues with the questionnaire's clarity and survey distribution methods must be addressed in future research to improve data accuracy and participant inclusivity. Moreover, the lack of follow-up support for participants in need of healthcare remains a critical issue, which highlights the importance of developing better ways to ensure participants receive necessary care. Future studies should focus on refining data collection methods, ensuring that questionnaires are clear, detailed, and consistent to improve data reliability. In addition, incorporating clinical assessments into future studies would enhance diagnostic accuracy and provide a more complete understanding of the prevalence of PMDs. Research should also explore alternative methods for follow-up, enabling researchers to provide proper guidance to participants and ensure that they receive appropriate healthcare interventions. Finally, longitudinal studies, which track participants over time, would also contribute significantly to understanding the long-term effects of PMDs and help establish causal relationships between these conditions and other psychological factors.

6. CONCLUSION AND RECOMMENDATIONS

This research has emphasized the importance of understanding premenstrual disorders (PMDs) and their profound impact on women's health and quality of life (QoL). The primary aim of this study was to explore the prevalence and effects of PMDs on women, shedding light on the complexities of these disorders and advocating for better recognition and management strategies. Specifically, the study sought to raise public awareness about the widespread impact of PMDs, to advocate for improved clinical practices and diagnostic criteria, advance management strategies, and to lay a foundation for future studies to enhance treatment protocols and refine public health policies. By focusing on a diverse range of lifestyle, psychological, and physical factors, this research ultimately aims to reduce the broader societal and economic burdens of PMDs, contributing to a deeper

understanding of how these conditions affect women's health, societal well-being and the broader public health implications.

Findings of this study revealed important insights regarding the prevalence and implication of PMDs on QoL, highlighting their debilitating nature and significant impact on overall well-being and work-life balance. Women with PMDs experience a broad range of physical and psychological symptoms interfering with their daily activities, hindering their ability to perform effectively in both personal and professional domains. 66.2% of participants reported limitations in their ability to work, concentrate, and engage in both professional and personal activities. Lifestyle factors such as the practice of yoga, meditation, and prayer were statistically associated with a reduced likelihood of experiencing PMS symptoms, highlighting the potential benefits of these practices in managing symptoms. Exercise also emerged as a key factor, statistically having a significant effect on depression and being associated with lower levels of anxiety. While a smaller percentage (6.9%) of women exercised to manage their symptoms, this suggests that physical activity may offer an effective way to reduce both psychological and physical distress related to PMDs.

A key finding showed the genetic link between family history and the prevalence of PMS, suggesting that women with a family history of mood disorders or PMS may be at a higher risk. Statistical relationships were found between lifestyle factors, such as stress, and both psychological and physical symptoms, contributing to a higher likelihood of PMS diagnosis. Factors like the age of first menstruation and irregular menstrual cycles also correlated significantly with the severity of PMD symptoms, including higher incidences of PMDD and related conditions. Several health conditions were linked to specific PMS symptoms, such as painful or swollen breasts and food cravings. Women with a history of trauma or stress reported experiencing more intense psychological and physical symptoms.

This study found that a stigma surrounding menstrual and reproductive health contributed to reluctance among women to seek support or openly discuss their symptoms, hindering appropriate care. Many women prefer alternative management options rather than seeking professional medical advice for menstrual cycle-related symptoms, indicating a gap in healthcare support.

Findings of this study contribute to a growing body of research that underscores the importance of public health awareness about the significant effects of PMDs on women's health and quality of life. By highlighting the gap in public and societal knowledge regarding women's health and mental well-being, this study underscores the need for improved healthcare policies, greater clinical

support, and more open dialogues regarding reproductive health issues. In light of these findings, it becomes evident that more attention should be given to early diagnosis and appropriate medical management, ensuring that women receive the care they need in a timely manner. It is essential in future research to refine diagnostic practices by incorporating clinical assessments alongside to improve the accuracy of PMD diagnoses. Furthermore, longitudinal studies tracking participants over time are particularly valuable for understanding the long-term effects of PMDs. These studies could help establish causal relationships between PMDs and other psychological or environmental factors. Finally, public health policies should be further developed to better support women affected by PMDs. Public health campaigns should focus on raising awareness about PMDs and fostering a deeper understanding of their impact on women's health, reducing stigma and improving the overall care of women experiencing these disorders. Clinical practices must consider the diverse nature of these disorders, integrating the full range of physical, psychological, and lifestyle factors, to improve treatment outcomes. This study lays the groundwork for future studies, urging researchers to explore alternative diagnostic criteria, investigate the psychosocial impact of PMDs in greater depth, and further examine the role of lifestyle interventions in reducing the severity of symptoms. The cross-sectional design of this study, along with the challenges in addressing participant needs, underscores the importance of incorporating follow-up mechanisms and refining sampling strategies to capture the full complexity of PMDs and ensure participants have access to appropriate care.

In conclusion, this study highlights the profound impact of PMDs on women's health and quality of life, underscoring the urgent need for a more comprehensive approach to their diagnoses and treatment options. The findings emphasize the importance of integrating biological, psychological, and environmental factors into clinical practices to better meet the diverse needs of women affected by PMDs. Future research should prioritize clinical assessments, longitudinal studies, and innovative follow-up methods to refine diagnostic accuracy, improve care delivery, and enhance our understanding of these complex disorders. By addressing the identified gaps, healthcare systems can provide more effective support, ultimately leading to improved health outcomes and a higher quality of life for women with PMDs. Furthermore, improving clinical practice and research will help reduce the broader societal and economic burdens associate with PMDs.

7. LIST OF REFERENCES

1. Pedro AO, Perez Brandao JD, de Oliveira Silva SB. Impact of age on premenstrual syndrome prevalence and severity: A population-based survey in Brazil. Int J Gynaecol Obstet. 2024 Sep 25;168(3):1221–8.

2. Halbreich U, Borenstein J, Pearlstein T. The prevalence, impairment, impact, and burden of premenstrual dysphoric disorder (PMS/PMDD). Psychoneuroendorcinology. 2003 Aug;28(3):1–23.

3. Brown D, Smith DM, Osborn E, Wittkowski A. The experiences and psychological impact of living with premenstrual disorders: a systematic review and thematic synthesis. Front Psychiatry [Internet]. 2024 Sep 2;15. Available from: https://pmc.ncbi.nlm.nih.gov/articles/PMC11402655/

4. Naik SS, Nidhi Y, Kumar K, Sandeep Grover. Diagnostic validity of premenstrual dysphoric disorder: revisited. Frontiers Glob Womens Health. 2023 Nov 27;4.

5. Firth S. MedPageToday. 2024. Suicide Risk Higher for Women With Premenstrual Disorders. Available from: https://www.medpagetoday.com/obgyn/generalobgyn/110356

6. Islas-Preciado D, Ramos-Lira L, Estrada-Camarena E. Unveiling the burden of premenstrual dysphoric disorder: a narrative review to call for gender perspective and intersectional approaches. Front Psychiatry [Internet]. 2025 Jan 21;15. Available from: https://pmc.ncbi.nlm.nih.gov/articles/PMC11790554/

7. Upadhyay M, Mahishale A, Kari A. Prevalence of premenstrual syndrome in college going girls - A cross sectional study. Clinical Epidemiology and Global Health [Internet]. 2023 Mar [cited 2024 Aug 24];20. Available from: https://linkinghub.elsevier.com/retrieve/pii/S2213398423000210

8. Reilly TJ, Patel S, Unachukwu IC, Knox CL, Wilson CA, Craig MC, et al. The prevalence of premenstrual dysphoric disorder: Systematic review and meta-analysis. Journal of Affective Disorders. 2024 Mar;349:534–40.

9. MayoClinic [Internet]. Premenstrual syndrome (PMS). Available from: https://www.mayoclinic.org/diseases-conditions/premenstrual-syndrome/symptoms-causes/syc-20376780

10. Al-Hmaid Y, Beni Yonis O, Alkhalili M, Kheirallah K. Premenstrual Syndrome's Impact on Work-Related Quality of Life Among Jordanian Nurses. Cureus [Internet]. 2024 Feb 1;2(16). Available from: https://pmc.ncbi.nlm.nih.gov/articles/PMC10909070/

11. Reilly T. Oxford University. 2024 [cited 2024 Aug 24]. New data shows prevalence of Premenstrual Dysphoric Disorder. Available from: https://www.ox.ac.uk/news/2024-01-30-new-data-shows-prevalence-premenstrual-dysphoric-disorder

12. Hantsoo L, Rangaswamy S, Voegtline K, Salimgaraev R. Premenstrual symptoms across the lifespan in an international sample: data from a mobile application. Arch Womens Ment Health. 2022 Aug 26;25(5):903–10.

13. Robinson J, Ferreira A, Iacovou M, Kellow NJ. Effect of nutritional interventions on the psychological symptoms of premenstrual syndrome in women of reproductive age: a systematic review of randomized controlled trials. Nutrition Reviews. 2024 Apr 29;83(2):280–306.

14. Direkvand-Moghadam A, Sayehmiri K, Kaikhavandi S. Epidemiology of Premenstrual Syndrome (PMS)-A Systematic Review and Meta-Analysis Study. J Clin Diagn Res. 2014 Feb;8(2):106–9.

15. Liguori F, Saraiello E, Calella P. Premenstrual Syndrome and Premenstrual Dysphoric Disorder's Impact on Quality of Life, and the Role of Physical Activity. Medicina. 2023 Nov 20;59(11):2044.

16. Rapkin AJ, Winer SA. Premenstrual syndrome and premenstrual dysphoric disorder: quality of life and burden of illness. Expert Review of Pharmacoeconomics & Outcomes Research. 2014 Jan;(9):157–70.

17. Schoep ME, Adang E. Productivity loss due to menstruation-related symptoms: a nationwide cross-sectional survey among 32 748 women. Obstetrics and gynaecology [Internet]. 2019 Jul;6(9). Available from: https://bmjopen.bmj.com/content/9/6/e026186.full

18. TVM. Vrouwen zijn gemiddeld 9 dagen per jaar minder productief door menstruatie. HLN, onlinemagazine BMJ Open [Internet]. 2019 Jul 11; Available from: https://www.hln.be/fit-en-gezond/vrouwen-zijn-gemiddeld-9-dagen-per-jaar-minder-productief-door-menstruatie~a8413e91/

19. Alders M. Radboud University. 2019. Vrouwen gemiddeld negen dagen per jaar uit de running door menstruatie. Available from: https://www.radboudumc.nl/nieuws/2019/vrouwen-gemiddeld-negen-dagen-per-jaar-uit-de-running-door-menstruatie

20. Tiranini L, Nappi RE. Recent advances in understanding/management of premenstrual dysphoric disorder/premenstrual syndrome. Fac Rev [Internet]. 2022 Apr 28 [cited 2024 Sep 8];11. Available from: https://facultyopinions.com/prime/reports/b/11/11/

21. Takeda T. Premenstrual disorders: Premenstrual syndrome and premenstrual dysphoric disorder. 2023 Feb;49(2):510–8.

22. Vakharia K. Premenstrual syndrome [Internet]. 2022. Available from: https://patient.info/doctor/premenstrual-syndrome-pro

23. Pinkerton JV. MSD Manual. 2023. Premenstrual Syndrome (PMS), (Premenstrual Dysphoric Disorder). Available from: https://www.msdmanuals.com/home/women-s-health-issues/menstrual-disorders-and-abnormal-vaginal-bleeding/premenstrual-syndrome-pms

24. Pinkerton JV. MSD Manual. 2023. Premenstrual Syndrome (PMS), Premenstrual Dysphoric Disorder, Premenstrual Tension. Available from: https://www.msdmanuals.com/professional/gynecology-and-obstetrics/menstrual-abnormalities/premenstrual-syndrome-pms

25. Gudipally PR, Sharma GK. Premenstrual Syndrome. In: StatPearls [Internet]. Treasure Island (FL): StatPearls Publishing; 2023 [cited 2024 Sep 9]. Available from: http://www.ncbi.nlm.nih.gov/books/NBK560698/

26. Oboza P, Ogarek N, Wojtowicz M, Ben Rhaiem T. Relationships between Premenstrual Syndrome (PMS) and Diet Composition, Dietary Patterns and Eating Behaviors. Nutrients. 12(16):1911.

27. Cary E, Simpson P. Premenstrual disorders and PMDD - a review. Best Practice & Research Clinical Endocrinology & Metabolism [Internet]. 2024 Jan;1(38). Available from: https://www.sciencedirect.com/science/article/pii/S1521690X23001343

28. Granda D, Szmidt MK, Kaluza J. Is Premenstrual Syndrome Associated with Inflammation, Oxidative Stress and Antioxidant Status? A Systematic Review of Case–Control and Cross-Sectional Studies. Antioxidants. 2021 Apr;4(10):604.

29. Rodgers AL. We Demand Attention on the Elevated Risk for PMDD and PPD Among Women with ADHD. ADDitute [Internet]. 2025 Apr 8; Available from: https://www.additudemag.com/adhd-and-pmdd-postpartum-depression-research/

30. Almahareeq M, Hamdan M, Vanoh D, Shawarb N, Herbawi J, Shawar E, et al. Comparison of premenstrual symptoms, psychological well-being, and nutritional status between Palestinian women with and without polycystic ovarian syndrome: a case-control study. BMC Womens Health [Internet]. 2024 Jun 21;24(360). Available from: http://pmc.ncbi.nlm.nih.gov/articles/PMC11191327/

31. Therapy H. Hopeful Minds. 2025. How to build a PMDD Support System including partners friends and community groups. Available from: https://www.hopefulminds.co.uk/how-to-build-a-pmdd-support-system-including-partners-friends-and-community-groups/

32. Maity S, Wray J, Coffin T. Academic and Social Impact of Menstrual Disturbances in Female Medical Students: A Systematic Review and Meta-Analysis. Frontiers in Medicine [Internet]. 2022 Feb 19;(9). Available from: https://pmc.ncbi.nlm.nih.gov/articles/PMC8886240/

33. Schoep M, Nieboer T, van der Zanden M, M Braat D, Nap AW. The impact of menstrual symptoms on everyday life: a survey among 42,879 women. Am J Obstet Gynecol. 2019 Jun;220(6):569.e1-569.e7.

34. Yu H, Yang Y, Nevriana A, Hysai E. Premenstrual disorders and risk of sick leave and unemployment: a prospective cohort study of 15,857 women in Sweden. 2024 Dec 3;

35. Hardy C, Hunter MS. Premenstrual Symptoms and Work: Exploring Female Staff Experiences and Recommendations for Workplaces. International Journal of Environmental Research and Public Health. 2021 Mar 31;18(7):3647.

36. Trieber K, Markevych I, Skottvoll BS, Hustad S, Bertelsen RJ. Lifelong exposure to residential greenspace and the premenstrual syndrome: A population-based study of Northern European women. Environment International [Internet]. 2022 Jan;(158). Available from: https://www.sciencedirect.com/science/article/pii/S0160412021006000

37. Sharp GC, De Giorgio L. Menarche, Menstruation, Menopause and Mental Health (4M): a consortium facilitating interdisciplinary research at the intersection of menstrual and mental health. Frontiers [Internet]. 2023 Aug 29;4. Available from: https://www.frontiersin.org/journals/global-womens-health/articles/10.3389/fgwh.2023.1258973/full

38. Bodmer C, Ehlert U, Eltbogen R, Stute P, Ging A. Interdisciplinary consensus on management of premenstrual disorders in Switzerland. Taylor and Francis Online (tandfonline). 2017 Mar 2;342–8.

39. Carlini SV, Scalea TL di, McNally ST, Lester J. Management of Premenstrual Dysphoric Disorder: A Scoping Review. International Journal of Women's Health. 2022 Dec 21;14:1783–801.

40. ABAY H, KAPLAN S. Current Approaches in Premenstrual Syndrome Management. Bezmialem Science. 2019 May 10;2(7):150–6.

41. Weir CB, Jan A. NIH National Library of Medicine. 2023. BMI Classification Percentile And Cut Off Points. Available from: https://www.ncbi.nlm.nih.gov/books/NBK541070/

42. Eurostat [Internet]. Glossary: Body mass index (BMI). Available from: https://ec.europa.eu/eurostat/statistics-explained/index.php?title=Glossary%3ABody_mass_index_%28BMI%29

43. World Health Organization [Internet]. A healthy lifestyle - WHO recommendations. Available from: https://www.who.int/europe/news-room/fact-sheets/item/a-healthy-lifestyle---who-recommendations

44. Dilbaz B, Aksan A. Premenstrual syndrome, a common but underrated entity: review of the clinical literature. Journal of the Turkish-German Gynecological Association. 2021 May 28;22(2):139–48.

45. Tschudin S, Bertea PC, Zemp E. Prevalence and predictors of premenstrual syndrome and premenstrual dysphoric disorder in a population-based sample. Arch Womens Ment Health. 2010 Dec;13(6):485–94.

46. Akbulut O, Jafari L, Ari DA, Kizilkan MP, Derman O, Akgul S. Prevalence of premenstrual syndrome in adolescent girls. Turk J Pediatr. 66(3):340–5.

47. Hantsoo L, Sajid H, Murphy L, Eisenlohr-Moul T, Barone J, Buchert B, et al. Patient Experiences of Health Care Providers in Premenstrual Dysphoric Disorder: Examining the Role of Provider Specialty. Journal of Women's Health. 2022 Jan 12;13(1):100–9.

48. Irshad A, Mehmood S, Mumtaz S, Noor R, Saleem M, Laique T. Frequency of Premenstrual Syndrome and Its Association with Quality of Life among University Students. Pakistan Journal of Medical & Health Sciences [Internet]. 2022 Nov 2;16. Available from: https://pjmhsonline.com/index.php/pjmhs/article/view/164

49. Cohen L, Soares CN, Otto MW, Sweeney BH. Prevalence and predictors of premenstrual dysphoric disorder (PMDD) in older premenopausal women. Journal of Affective Disorders. 2002 Jul;70:125–32.

50. Potter J, Bouyer J, Trussel J, Moreau C. Premenstrual Syndrome Prevalence and Fluctuation over Time: Results from a French Population-Based Survey. Journal of Women's Health. 2009 Jan;18(1):31–9.

51. Hantsoo L, Epperson CN. Premenstrual Dysphoric Disorder: Epidemiology and Treatment. Curr Psychiatry Rep. 2015 Nov;17(11):87.

52. Modzelewski S, Oracz A, Zukow X, Ilendo K, Waszkiewicz N. Premenstrual syndrome: new insights into etiology and review of treatment methods. Frontiers in Psychiatry [Internet]. 2024 Apr 23;15. Available from: https://pmc.ncbi.nlm.nih.gov/articles/PMC11075635/

53. Hantsoo L, Payne JL. Towards Understanding the Biology of Premenstrual Dysphoric Disorder: From Genes to GABA. Neuroscience Biobehav Rev [Internet]. Available from: https://pmc.ncbi.nlm.nih.gov/articles/PMC10176022/

54. Branecka-Wozniak D, Cymbaluk-Ploska A, Kurzawa R. The impact of premenstrual syndrome on womens quality of life - a myth or a fact? European Review for Medical and Pharmacological Sciences. 2022 Feb 2;26(2):598–609.

55. Dadoniene ProfDJ, Danila ProfDE, Utkus ProfDA, Brukiene ProfDV, Dadeliene ProfDR, Garuoliene AssocProfDK, et al. Methodological Guidelines for the Preparation, Defence and Storage of Final Thesis [Internet]. Faculty of Medicine of Vilnius University; 2023. Available from: https://www.mf.vu.lt/images/Methodological_guidelines_for_teh_preparation_Faculty_of_Medicine_2023.pdf

56. OpenAI ChatGPT [Internet]. 2025. OpenAI ChatGPT. Available from: https://openai.com/chatgpt

57. Zotero 7 for Windows [Internet]. (Zotero). Available from: https://www.zotero.org/

58. Hopkins Medicine [Internet]. Premenstrual Dysphoric Disorder (PMDD). Available from: https://www.hopkinsmedicine.org/health/conditions-and-diseases/premenstrual-dysphoric-disorder-pmdd

8. ACKNOWLEDGEMENTS

This thesis is written in accordance with the Methodological Guidelines for the Preparation, Defence and Storage of Final Thesis at the Faculty of Medicine of Vilnius University 2023 (55).

Certain sections of this thesis, particularly the introduction and methods sections, were supported by OpenAI's ChatGPT model (OpenAI, 2025) in refining certain aspects of the content and enhancing clarity. This support included offering writing suggestions such as rephrasing paragraphs for academic style and readability, improving sentence flow, providing synonyms and alternative expressions, identifying key messages, clarifying concepts, and eliminating redundancy (56).

For the list of references, the bibliographic management software tool Zotero was used, as it was recommended in the Methodological Guidelines for the Preparation, Defence and Storage of Final Thesis at the Faculty of Medicine of Vilnius University 2023 (55,57).

I would like to express my sincere gratitude to the supervisor, Assistant Professor Virginija Paliulyte for her support and advice during the research and writing process. Special thanks are extended to Gabija Matuzaite, a fifth-year student (group 11, *gabija.matuzaite@mf.stud.vu.lt*) for assisting in the statistical analyses.

An appreciative thank you to all staff of Vilnius University and the Santaros Teaching Hospital for their comprehensive support provided throughout the study years. The collective assistance from doctors, professors, and the dean's office has been instrumental in facilitating my academic journey.

9. ANNEXES

9.1 Annex 1. Additional tables and figures of the article

Table 1: Physiological and Psychological Symptoms of Premenstrual Disorders (9,23,58)

Psychological symptoms	Agitation
	Anxiety
	Anger
	Confusion
	Crying spells
	Difficulty concentrating
	Depression
	Emotional hypersensitivity
	Feeling overwhelmed or out of control
	Forgetfulness or memory loss
	Insomnia, including difficulty falling or staying asleep at night
	Irritability
	Lack of interest in activities once enjoyed
	Mood swings and crying
	Moodiness, Short temper
	Nervousness
	Paranoia
	Trouble sleeping
	Restlessness
	Poor self-image
	Social withdrawal
	Severe fatigue
Physical symptoms	
Fluid retention	Swelling ankles, hands, feet
	Periodic weight gain
	Diminished urine output
	Swelling and tenderness of breast, breast fullness and pain
Eye complaints	Vision changes, eye infection
Skin conditions	Acne and localized scratch dermatitis
	Skin inflammation with itching
	Aggravation of other skin disorders, including cold sores

Gastrointestinal symptoms	Changes in appetite, food cravings
	Bloating
	Nausea
	Constipation
	Vomiting
	Abdominal cramps
	Pelvic heaviness or pressure
Respiratory conditions	Allergies, infections
	Nose and airway congestion
Neurological and vascular	Headache
	Fatigue
	Dizziness, vertigo
	Easy bruising
	Awareness of heartbeats (palpitations)
	Muscle spasms, joint and muscle pain
	Fainting
	Heightened sensitivity of arms or legs
	Numbness, prickling, tingling Pins-and-needles sensation in the hands and feet
Others	Lower back pain
	Decreased coordination
	Painful menstruation
	Diminished sex drive
	Hot flashes
	Lack of energy
Health conditions / diseases	Hypothyroidism
	Endometriosis
	Chronic fatigue syndrome
	Fibromyalgia
	Systemic lupus erythematosus (SLE) or Rheumatoid arthritis, with flare-ups
	Dysmenorrhoea
	Irritable bowel syndrome
	Interstitial cystitis
	Anaemia, including iron deficiency anaemia, B12 deficiency anaemia, and folate deficiency anaemia
	Migraines

9.2 Annex 2. Questionnaire

http://forms.gle/cRnfRJqXKNn8jGxA8

1. How old are you?
    a. ≤ 20 years old
    b. 21-30 years old
    c. 31-40 years old
    d. 41-50 years old
    e. ≥51 years old
2. What is your profession?
    a. Student
    b. Working in office/school and education
    c. Working in healthcare
    d. Stay at home mother
    e. Working from home/remotely
    f. Have a business
    g. Other …
3. Do you have a partner?
    a. Yes
    b. No
4. Have you previously had any pregnancies and labour?
    a. Yes, I have been pregnant and I gave natural birth
    b. Yes, I have been pregnant and I had a C-section
    c. Yes, I have been pregnant but I had a miscarriage
    d. No, I have not been pregnant
5. Do you use contraception?
    a. No, I do not use any contraception
    b. No, not at this moment, but I have used before
    c. Yes, I am using the pill
    d. Yes, I have an IUD (including barrier, spiral, ring)
    e. Other
6. How would you describe your health in general?
    a. Rather healthy
    b. Unhealthy, because of certain lifestyle choices
    c. Unhealthy, because I have a chronic disease
    d. Other

7. What is your BMI (body mass index)?
    a. <18.5
    b. 18.5-25
    c. 25-30
    d. >30
8. Do you exercise?
    a. Yes
    b. No
9. Do you practice yoga, meditation, or prayers?
    a. Yes
    b. No
10. Are you taking any medication?
    a. Yes (go to question 11+12)
    b. No (go to question 13)
11. If yes, for which condition?
    a. Headache, migraines
    b. Chronic pain
    c. Allergies
    d. Asthma and COPD
    e. Hypertension (high blood pressure)
    f. Diabetes (high blood sugar)
    g. Thyroid
    h. Autoimmune disorders (Lupus, Rheumatoid Arthritis, …)
    i. Gynaecological problems (PCOS, Endometriosis, …)
    j. Mood disorders, such as depression, anxiety, …
    k. Vitamin deficiency
    l. Other …
12. Is it over the counter or prescription medication
    a. Over the counter
    b. Prescription
13. When did you have your first menstrual cycle?
    a. Before the age of 12
    b. Between the age of 13-15
    c. Between the age of 16-18
    d. After the age of 18

14. Do you have a regular menstrual cycle (21-35 days)?
    a. Yes (go to question 16)
    b. No (go to question 15)
15. If irregular, how often per year do you get your period?
    a. Less than 4 times a year
    b. 4 times a year (every 3 months)
    c. 6 times a year (every 2 months)
    d. Every 1.5 month (6 weeks)
    e. Every 1 month (regular)
    f. Ever 2-3 weeks (15-21 days)
    g. I don't know
    h. Other
16. Do you track your period?
    a. Yes, I do it manually
    b. Yes, I use a period tracking application on my smartphone
    c. Yes, I use a calendar at home
    d. No, I do not track my period
17. How heavy is your menstrual cycle?
    a. Light
    b. Moderate
    c. Heavy
18. Which symptoms do you experience during your period? (that is 1 week before the start of bleeding and during the week of bleeding [*multiple answers possible*])
    a. Headache
    b. Abdominal pain (belly and stomach)
    c. Back pain
    d. Leg pain
    e. Painful /swollen breasts
    f. Fatigue (tiredness)
    g. I do not experience any of these symptoms
    h. Others …

19. Have you experienced the following symptoms during your cycle? (that is 1 week before the start of bleeding and during the week of bleeding [*multiple answers possible*])
    a. Mood swings
    b. Excessive food cravings
    c. Loss of appetite
    d. Highly sensitive and emotional
    e. Feeling that you cannot breath or do not have enough oxygen (breathlessness)
    f. I do not experience any of these symptoms (go to question 22)
    g. Others …
20. Have you experienced these symptoms (*mentioned in question 19*) outside your period? (that is more than 1-2 weeks before the start of bleeding, or during times that you do not have bleeding)
    a. Yes
    b. No
21. Have you experienced these symptoms (*mentioned in question 19*) on a regular basis, in relation to your cycle?
    a. Yes, every month
    b. Yes, often
    c. Yes, a few times
    d. No / I don't know
22. Do the symptoms that you experience during the period affect your daily activities?
    a. Yes (go to question 23)
    b. No (go to question 24)
23. How does it affect your life?
    a. I cannot focus on my work or studies/I do not wish to work or study anymore
    b. I have low motivation to do anything during my day
    c. I experience severe pain that impairs my work
    d. Some days I have to stay at home
    e. I still can do some work, but with difficulties
    f. I have to cry (a lot)
    g. I am more easily irritated by little things
    h. I get into conflicts with family and friends
    i. Other …

24. Have you looked up your symptoms before on the internet?
    a. Yes
    b. No
25. Have you visited a doctor regarding what you have experienced?
    a. Yes (question 26)
    b. No (Question 27)
26. If yes, which doctor?
    a. Gynaecologist
    b. Primary health care doctor / Family doctor
    c. Psychologist
    d. Gastroenterologist
    e. Other …
27. Have you had a time in which you had low energy and motivation?
    a. Yes
    b. No
28. Does this time of bad feeling happen on a regular basis?
    a. Yes, every month
    b. Yes, mainly during the summer
    c. Yes, mainly during the winter
    d. No, I don't have this
    e. I don't know
29. Do you have someone to talk to when you do not feel well?
    a. Yes
    b. No
30. Who would you turn to when you need to talk during difficult times?
    a. A friend
    b. A family member
    c. A doctor
    d. Therapist (psychologist/psychotherapist)
    e. Other…
31. Have you had any history of trauma or a highly stressful event?
    a. Yes
    b. No

32. Have you heard of Premenstrual Syndromes (PMS) before?
    a. Yes
    b. No
33. Do you have any family history of PMS or any mood disorders?
    a. No/I don't know
    b. Yes, PMS
    c. Yes, anxiety
    d. Yes, depression
    e. Yes, other mood disorders
    f. Others…
34. Have you been diagnosed (by a professional physician) with any of the following conditions?
    a. Obesity
    b. Polycystic Ovary Syndrome (PCOS)
    c. Depression
    d. Anxiety
    e. Endometriosis
    f. Reproductive disorders
    g. Premenstrual Syndrome (PMS)
    h. Premenstrual Dysphoric Disorder (PMDD)
    i. Chronic Fatigue Syndrome
    j. Thyroid disorders
    k. None of the above (go to question 36)
    l. Other …
    m. I have not been diagnosed by a professional, but I know I have it. I have the symptoms
35. If you have been diagnosed with one of these conditions (*in the previous question*), are you taking any medication to relieve the symptoms?
    a. Yes, I got a prescription from a doctor
    b. Yes, I am buying over the counter medicine which helps relieve the symptoms
    c. No, I don't take medications, I do exercise which helps to reduce the symptoms
    d. No, I don't take medications, I take other supplements that help reduce the symptoms
    e. No, I am not taking medications, I am managing the symptoms in a different way
    f. Other…

36. Would you like to take medications to reduce some of the symptoms (like mood swings, fatigue, appetite)?
    a. Yes, for mood swings
    b. Yes, for fatigue. I would like to have more energy
    c. Yes, for appetite. I would like to eat more/less
    d. No, not medication. I want other remedies
    e. No, I don't like pills, but I am open for therapy
    f. No, I do not wish to take any medication
    g. No, I don't want any type of care (no medicine, no therapy)
    h. Other…
37. How do you cope with bad feelings? What do you do that helps you feel better?
38. If there is anything that could be done to change your health, what would you like that to be?
39. Do you have any additional information you would like to share (or any feedback related to this questionnaire? (*Any feedback will be appreciated. Any question that I forgot to ask and you think would be relevant, you can write here. Thank you for your time. Appreciate your cooperation*)