Backache during Pre-menstruation Syndrome and its Association with Behavior Changes in Physical Therapy Students

Iqra Hameed[1]*, Amina Zartasha[2], Rimsha Tariq[3], Hira Chudhary[4], Ayesha Haq[5] and Nawal Farooq[6]

[1]Department of Physical Therapy, Riphah International University, Lahore, Pakistan
[2]Department of Clinical Physiotherapy, Ali Medical Complex, Islamabad, Pakistan
[3]Hajvery University, Lahore, Pakistan
[4]Department of Clinical Physiotherapy, College of Sant Miquel, Barcelona, Espana
[5]Department of Clinical Physiotherapy, Novimed Specialist Clinic, Lahore, Pakistan
[6]MSK Physiotherapist and Site Lead at IPRS Health, London, UK

Abstract

Background: Pre Menstruation Syndrome (PMS), a condition that affects women prior to their menstrual cycle, is characterized by a combination of behavioural and physical symptoms, which can include back pain and other behavior changes. It typically starts a few days before menstruation and lasts for a short while after it starts.

Objective: This study focused to investigate the prevalence of backache during Pre-Menstrual Syndrome (PMS) and its association with behavior changes among physical therapy students. By examining these factors, the research aimed to provide valuable insights into the impact of PMS on the well-being of physical therapy students and contribute to a better understanding of this important issue.

Methodology: The study included 235 female university students from Riphah International University in Lahore. It sought to determine the prevalence of low back pain and behavioural changes associated with Pre-Menstrual Syndrome (PMS) among these students. The data was collected using a self-reported questionnaire based on relevant literature. The study took place over a four-month period and specifically targeted students studying physical therapy. The start backache scale was used to assess the prevalence of low back pain during PMS, while the depression anxiety stress scale was used to assess the associated behavioural component.

Results: The study findings indicate a strong correlation between backache during Pre-Menstrual Syndrome (PMS) and behavioural changes. The prevalence of backache complaints during PMS was found to be high, reaching 32.8%. Additionally, the study revealed a high prevalence of anxiety (32.3%), depression (25.1%) and stress (20.4%) among the participants.

Conclusion: In conclusion, the study found a significant association between the prevalence of backache and behavioural changes during Pre-Menstrual Syndrome (PMS) among female physical therapy students.

Limitations: The study's limitations stem from its single-centre design and specific focus on physical therapy students, limiting generalizability. Additionally, the small sample size and lack of available data on the association between backache and behavior changes during premenstrual syndrome among this population further constrain the study's scope.

Keywords: Backache • Behavior changes • Physical therapy students • Prevalence • Premenstrual syndrome

Introduction

Pre-Menstrual Syndrome (PMS) is characterized by cyclic symptoms that occur during the menstrual cycle's luteal phase [1]. It manifests itself by a variety of distressing behavioural, physical and psychological changes that have a significant impact on relationships between individuals, interaction with others and routine tasks. These symptoms usually improve when menstruation begins or shortly thereafter [2]. Various emotional, physical and behavioural symptoms that appear in women of reproductive age prior to the monthly menstrual cycle are referred to as Pre-Menstrual Syndrome (PMS) [3]. Young females social, psychological and mental wellbeing are significantly impacted by the rising prevalence of PMS in both developed and developing nations. To understand and address the factors causing this trend's prevalence among this population, more research and healthcare initiatives are needed [4].

A number of usual symptoms, such as discomfort, headaches and migraines abdominal discomfort, breast tenderness, irritation, anxiety, mood fluctuations, trouble sleeping, changes in eating habits, trouble concentrating, withdrawal from social interactions, feelings of despair and a feeling of being out of control, are indicative of PMS [5]. Six major issues have been identified among these symptoms as fundamental indicators, indicating that a core set of symptoms can be used to make a clinical diagnosis of PMS [6]. The prevalence of musculoskeletal discomfort, specifically backache, among female students pursuing physical therapy has shown a consistent upward trend. This can be attributed to the expanding population of physical therapists and the occupational demands placed on them, such as prolonged standing and strenuous biomechanical activities. Consequently, these students are at a higher risk of developing backache and related behavioural alterations during the phase of Pre Menstruation Syndrome [7]. Therefore, it is imperative to advance our comprehension of the frequency and association of backache with behavioural changes among physical therapy

students during pre-menstruation syndrome.

The hormonal dynamics of the menstrual cycle exert variable effects on women, exhibiting diverse patterns across different age cohorts and individuals. While neurochemical alterations in the central nervous system can impact stress and emotional states, they do not directly underpin the etiology of Pre Menstruation Syndrome (PMS); nevertheless, they can exacerbate its symptomatic manifestation [8]. Lower back pain experienced during menstruation originates from muscular sources and is modulated by hormonal fluctuations. Prostaglandins, bioactive lipid mediators released during menstrual flow, instigate uterine contractions, potentially influencing the musculature of the lower back and instigating pain. Elevated prostaglandin levels may contribute to dysmenorrhea, characterized by distressing menstrual periods, wherein discomfort radiates from the lower abdominal or umbilical regions to the lumbar region [9].

A research investigation by Hoyer J, et al. sought to explore the occurrence of symptoms associated with premenstrual syndrome (PMS) and their correlation with mood and anxiety disorders. The study involved 206 women seeking treatment for PMS and structured clinical interviews were conducted to assess the presence of mood and anxiety disorders. The results indicated that around 39% of the participants fulfilled the criteria for either mood or anxiety disorders, underscoring the notable overlap between PMS symptoms or underlying depressive disorders. In this sample, mood disorders were observed to be twice as prevalent as anxiety disorders. The study underscores the significance of early identification and management of emotional disorders to enhance outcomes and minimize the likelihood of chronic illness. The serotonin deregulation hypothesis, a widely investigated and frequently implicated factor, is considered a potential cause of PMS [10].

A research investigation carried out at the high school of medicine, King Faisal University, Saudi Arabia, during the period from June to December 2009, examined a group of 250 medical students. The participants completed modified questionnaires that followed the guidelines provided by the American College of Obstetrics and Gynaecology for diagnosing Pre-Menstrual Syndrome (PMS). These questionnaires also included inquiries about physical activity, mental well-being, demographic information and reproductive factors. The findings revealed that PMS was present in 35.6% of the cases, with 45% characterized as mild, 32.6% as moderate and 22.4% as severe [11].

This study seeks to investigate the occurrence of backache during Pre-Menstrual Syndrome (PMS) among physical therapy students and explore its correlation with behavioural changes. By focusing on this specific group, the research will provide valuable insights into the frequency and intensity of backache symptoms experienced by physical therapy students during PMS, an aspect that has received limited attention in previous research. Comprehending the prevalence and impact of backache in this context is vital for healthcare professionals to effectively support and manage these students. Additionally, the study will examine the connection between backache and behavioural changes, illuminating the interaction between physical and psychological factors during PMS. The findings will contribute to existing literature, inform targeted interventions and enhance the well-being of physical therapy students affected by PMS. Ultimately, this research holds significance in advancing our understanding of PMS-related backache and its implications for individuals pursuing careers in physical therapy.

Materials and Methods

This study utilized a cross-sectional survey design to explore the occurrence of backache during Pre-Menstrual Syndrome (PMS) and its connection to behavioural changes in physical therapy students at Riphah International University, Lahore campus. The data collection spanned approximately four months and involved a sample of physical therapy students aged 18-30 from Riphah International University. Convenient non-probability sampling was employed to select a group of 235 female students enrolled in the doctor of physical therapy program. The study included physical therapy students at Riphah International University, Lahore campus, within the specified age range, as the target population. Exclusion criteria comprised students from other universities, females taking anti-depressant medication, those who had experienced emotional trauma in the past six months and individuals with gynaecologic issues such as polycystic ovaries, endometriosis, or pelvic inflammatory disease.

The assessment tool used was the start back tool scoring system. Data collection involved the use of a standardized questionnaire and informed consent was obtained from the participating physical therapy students to ensure their voluntary involvement in the study. The questionnaire incorporated the depression, anxiety, stress scale and the start back tool to investigate the prevalence of backache during PMS and its relationship to behavior changes in physical therapy students. Data entry and analysis were conducted using SPSS version 16, with measures taken to securely store response sheets and protect personal information. Data analysis employed the Statistical Package for the Social Sciences (SPSS) version 21, presenting descriptive statistics such as means and standard deviations to elucidate the socio-demographic data and scores from the depression, anxiety, stress scale and the start back tool scoring system. This comprehensive methodology yielded valuable insights into the occurrence of backache during PMS and its correlation with behavior changes among physical therapy students, making a noteworthy contribution to the existing body of knowledge in this field.

Results

Data was gathered from a sample of 235 physical therapy students enrolled at Riphah International University in Lahore. The analysis of demographic information revealed that the average age of the participants was 21.43 with a standard deviation of 1.809. These demographic findings provide valuable insights into the characteristics of the study population, specifically the age distribution of physical therapy students at Riphah International University. The average age of 21.43 indicates that the majority of the participants were in their early twenties, which is a critical period in their educational and professional development. The standard deviation of 1.809 suggests that the ages of the participants varied to some extent around the mean, highlighting the diverse age range within the sample. Understanding the age distribution of the participants is
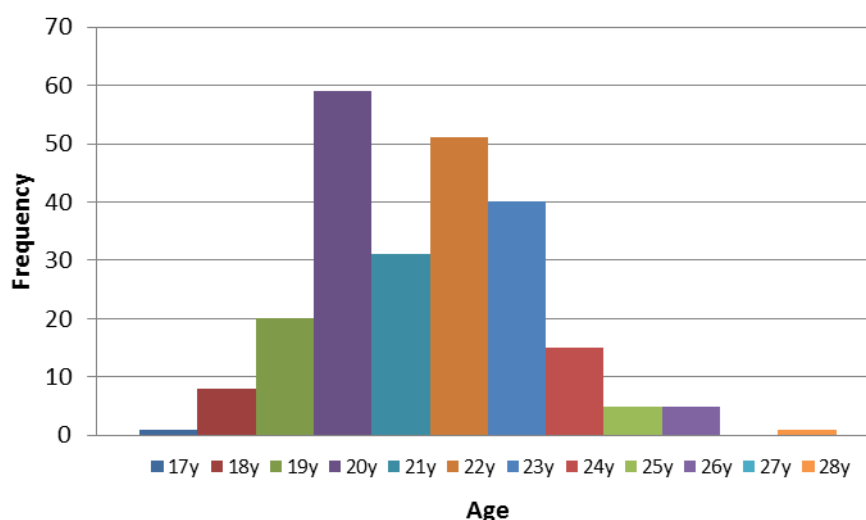

Figure 1. Age of participants.

essential for interpreting the study findings accurately. It helps contextualize the prevalence of backache during premenstrual syndrome and its association with behavior changes among physical therapy students within the specific age group of 21.43 years on average (Figure 1).

Frequency distribution of depression, anxiety and stress

The findings of the study provided insights into the participants mental health status. The mean depression score was 16.75, indicating the average level of depressive symptoms reported by the physical therapy students. The mean anxiety score was 14.94, reflecting the average level of anxiety symptoms experienced by the participants. The mean stress score was 15.13, representing the average level of perceived stress among the students. The overall score on the Depression, Anxiety and Stress Scale (DASS) was 46.82, indicating the combined impact of these three factors on the participants well-being. Further analysis of the data using frequency distribution revealed the distribution of participants across different categories of depression, anxiety and stress. In the depression category, 23.4% of the participants fell into the normal range, 14.5% were classified as having mild symptoms, 25.1% experienced moderate symptoms, 23.4% reported severe symptoms and 13.6% described their symptoms as extremely severe. Among the participants, 23.8% were classified as having normal anxiety levels, 9.4% exhibited mild anxiety symptoms, 20.0% reported moderate anxiety symptoms, 14.5% experienced severe anxiety and 32.3% described their anxiety symptoms as extremely severe. In terms of stress, 52.3% of the participants fell within the normal range, 11.9% reported mild stress levels, 20.4% experienced moderate stress, 12.3% described their stress as severe and 3.0% reported extremely severe stress levels. These detailed findings provide a comprehensive understanding of the mental health profile of the physical therapy students, shedding light on the prevalence and severity of depression, anxiety and stress symptoms within the study population (Table 1).

Start back tool score

The analysis of the results provided insights into the participants risk levels for backache as assessed by the start back tool. The mean score on the start back tool was found to be 1.95 with a standard deviation of 0.841, indicating the average level of risk for experiencing backache among the physical therapy students. Further analysis of the data using frequency distribution revealed the distribution of participants across different risk categories for backache. Among the participants, 37.9% were classified as having a low risk of backache, indicating a relatively lower likelihood of experiencing backache symptoms. A total of 29.4% fell into the medium-risk category, suggesting a moderate level of risk for backache. Additionally, 32.8% of the participants were classified as having a high risk of backache, indicating a greater likelihood of experiencing backache symptoms. These findings provide valuable insights into the risk levels for backache among the physical therapy students, allowing for a comprehensive understanding of the prevalence and distribution of backache risk within the study population (Figure 2).

Discussion

The primary objective of this research endeavour was to investigate the prevalence of backache during Pre-Menstruation Syndrome (PMS) and its association with behavior changes among physical therapy students enrolled at Riphah International University in Lahore, Pakistan. A robust sample size of 235 dedicated physical therapy students voluntarily participated in this study, providing valuable data for analysis. To effectively capture relevant information, the participants completed the well-established assessment tools known as the Depression Anxiety Stress Scale (DASS) and the start back tool scoring system. These instruments were carefully selected to measure and quantify the occurrence of backache and behavioural alterations experienced by the participants during the critical phase of PMS. By employing these sophisticated tools, the research aimed to illuminate the relationship between PMS, backache and behavior changes among physical therapy students in a comprehensive and systematic manner.

In the study conducted by Tabassum S, et al. the authors examined the intensity of emotional, physical and behavioural symptoms linked to premenstrual syndrome (PMS). The findings indicated that a significant proportion of females experienced backache (approximately 75.7%), anxiety (54%) and stress (60.4%) during this phase. Building upon this research, our study focused on the prevalence of backache among females suffering from PMS, revealing that approximately 32.8% reported complaints related to backache. Additionally, the study evaluated the mean scores for depression (16.75%), stress (15.13%), anxiety (14.94%) and the overall mean score for the Depression Anxiety Stress Scale (DASS) (46.82%). These results contribute to a deeper understanding of the multifaceted nature of symptoms experienced by individuals with PMS, shedding light on the specific prevalence rates and mean scores associated with backache, depression, stress and anxiety [2].

In the research conducted by Bakhshani NM, et al. it was observed that

Table 1. Frequency distribution of depression, anxiety and stress.

	Normal	Mild	Moderate	Severe	Extremely severe	Total
Depression	55(23.4%)	34(14.5%)	59(25.1%)	55(23.4%)	32(13.6%)	235
Anxiety	56(23.8%)	22(9.4%)	47(20%)	34(14.5%)	76(32.3%)	235
Stress	123(52.3%)	28(11.9%)	48(20.4%)	29(12.3%)	7(3.0%)	235

Pie chart of Start Back Tool scores

■ Low risk of Backache ■ Medium risk of Backache ☐ High risk of Backache
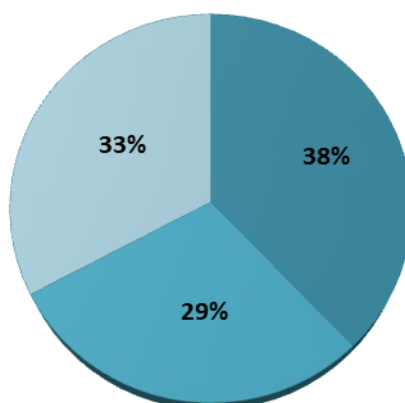

Figure 2. Start back tool scores.

females experienced various premenstrual symptoms, including backache, which was found to be associated with behavioural changes. The study revealed that a significant percentage of females reported experiencing mild to severe symptoms such as tiredness or lethargy (84%), sudden feelings of tearfulness (70.3%), anxiety (70%), backache (69%) and sleep problems (66%). These findings highlight the interplay between physical symptoms, particularly backache and behavioural changes during the premenstrual syndrome [12]. The current study further supports the positive relationship observed between behavioural changes and the premenstrual period, both in terms of physical manifestations and statistical analysis.

The current study has provided compelling evidence regarding the high prevalence of backache complaints among the participants, with a rate of 32.8%. Backache, characterized by sensations of numbness, tingling, or weakness in the lower extremities, often accompanied by sharp or shooting pain radiating down the leg, signifies a significant musculoskeletal issue. Moreover, findings of current also revealed a considerable prevalence of anxiety, accounting for 32.3% of the participants. Anxiety, stemming from episodes of terror, impulsive worries, or the perception of impending doom, can greatly impact an individual's emotional well-being. Furthermore, recent study identified depression as a prevalent complaint, affecting 25.1% of the participants. Depression, more than a fleeting feeling, represents a mood disorder characterized by a pervasive sense of sadness and disinterest. Lastly, stress, reported by 20.4% of the participants, manifests as a state of emotional or physical tension. Collectively, these findings strongly support the notion of a substantial association between backache during premenstrual syndrome and notable behavior changes experienced by the participants.

Conclusion

In conclusion, this study establishes a clear link between the prevalence of backache and behavior changes during PMS among female physical therapy students. The findings emphasize the significance of recognizing and addressing these symptoms to enhance the well-being and overall quality of life of these students.

Limitations of the Study

Single center: The study was conducted at a single center, which may limit the generalizability of the findings to a wider population.

Lack of generalizability: Due to the single-center nature of the study and the specific focus on physical therapy students, the generalizability of the results to other populations or settings may be limited.

Limited sample size: The study had a relatively small sample size, which may impact the statistical power and precision of the findings.

Rare data availability: There is a scarcity of available data specifically addressing the association between backache and behavior changes during premenstrual syndrome among physical therapy students, which may limit the extent of existing research and comparability with other studies.

Recommendations

Conduct awareness seminars to educate physical therapy students about PMS, its symptoms, management strategies and available resources.

Provide psychological counseling sessions to support students in managing the psychological impact of PMS and behavior changes.

Encourage a healthy lifestyle through promoting healthy food choices, regular aerobic exercises and relaxation techniques.

Teach ergonomics principles and postural correction techniques to reduce the risk of backache during PMS.

Identify and address causative factors contributing to behavior changes during PMS through individualized assessments and support.

Create awareness of work-related advice and postural modifications to optimize health and productivity, including avoiding prolonged periods of standing or sitting and incorporating regular breaks.

Acknowledgement

Disclaimer

This work hasn't been addressed, publicly available online or published in any book.

Conflict of Interest

None of the authors have revealed any potential conflicts of interest, thereby ensuring the integrity and impartiality of the research findings presented in the manuscript. This commitment to transparency safeguards against any undue influence that could arise from affiliations, financial relationships, or personal interests that may compromise the objectivity of the study or the publication process. By adhering to this disclosure requirement, the authors demonstrate their dedication to upholding the highest ethical standards and promoting trust in the scientific community. It further strengthens the credibility of the work and ensures that the research outcomes are based solely on scientific merit and rigorous investigation.

Funding Disclosure

References

1. Itriyeva, Khalida. "Premenstrual syndrome and premenstrual dysphoric disorder in adolescents." *Curr Probl Pediatr Adolesc Health Care* (2022): 101187.

2. Tabassum, Samia, Bilqis Afridi, Zahid Aman and Wajeeha Tabassum, et al. "Premenstrual syndrome: Frequency and severity in young college girls." *Anxiety* 45 (2005): 4-5.

3. Dutta, Abhijit and Avinash Sharma. "Prevalence of premenstrual syndrome and premenstrual dysphoric disorder in India: A systematic review and meta-analysis." *Health Promot Perspect* 11 (2021): 161.

4. Freeman, Ellen W. and Steven J. Sondheimer. "Premenstrual dysphoric disorder: Recognition and treatment." *Prim Care Companion J Clin Psychiatry* 5 (2003): 30.

5. Çitil, Elif Tuğçe and Nurten Kaya. "Effect of pilates exercises on premenstrual syndrome symptoms: A quasi-experimental study." *Complement Ther Med* 57 (2021): 102623.

6. Delara, Mahin, Fazlollah Ghofranipour, Parviz Azadfallah and Sedigheh Sadat Tavafian, et al. "Health related quality of life among adolescents with premenstrual disorders: A cross sectional study." *Health Qual Life Out* 10 (2012): 1-5.

7. Kashif, Muhammad, Tasbeeh Kokab, Zobia Rafique and Aatik Arshi, et al. "prevalence of low back pain among physiotherapy students of Riphah College of Rehabilitation Sciences." *J Liaquat Univ Med Health Sci* 19 (2020): 280-284.

8. Granda, Dominika, Maria Karolina Szmidt and Joanna Kaluza. "Is premenstrual syndrome associated with inflammation, oxidative stress and antioxidant status? A systematic review of case–control and cross-sectional studies." *Antioxidants* 10 (2021): 604

9. Biyani, Ashok and Gunnar BJ Andersson. "Low back pain: Pathophysiology and management." *J Am Acad Orthop Surg* 12 (2004): 106-115.

10. Hoyer, Jana, Inga Burmann, Marie-Luise Kieseler and Florian Vollrath, et al. "Menstrual cycle phase modulates emotional conflict processing in women with and without Premenstrual Syndrome (PMS): A pilot study." *PloS one* 8

(2013): e59780.

11. Balaha, M., M. A. E. M. Amr, M. Moghannum and N. Muhaida. "The phenomenology of premenstrual syndrome in female medical students: A cross sectional study." *Pan Afr Med J* 5 (2010).

12. Bakhshani, Nour Mohammad, Mahnaz Nowroozi Mousavi and Golbahar Khodabandeh. "Prevalence and severity of premenstrual symptoms among Iranian female university students." *J Pak Med Assoc* 59 (2009): 205-8.

How to cite this article: Hameed, Iqra, Amina Zartasha, Rimsha Tariq and Hira Chudhary, et al. "Backache during Pre-menstruation Syndrome and its Association with Behavior Changes in Physical Therapy Students." *Physiother Rehabi* 8 (2023): 331.