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Menstrual Cycle and Physical Activity in Physiotherapy: An Overview of Current Research and Developments

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Abstract:

The menstrual cycle is a natural physiological process that can influence various aspects of female health, including physical performance and response to physical activity and exercise. In recent years, growing attention has been given to understanding the relationship between menstrual cycle phases and exercise, particularly in the context of physiotherapy and performance related to sports. The present research study aims to examine the research trends and thematic developments in these areas using a quantitative approach name bibliometric analysis. Relevant literature was collected from the PubMed database on March 20, 2026, using the search term "menstrual cycle and physiotherapy." A total of 352 records were initially identified, which were later refined to 44 studies based on publication period, full-text availability, and human subject filters. The collected data were analyzed using VOS viewer software to identify keyword co-occurrence patterns and major research themes. The research findings indicate that most research studies focus on female populations, especially adults and young adults, with increasing attention toward exercise, muscle performance, and menstrual health issues such as dysmenorrhea. The network and density visualizations revealed strong connections between menstrual cycle-related terms and physical activity and exercise variables, highlighting the growing interest in this area. However, the analysis of the research also suggests that certain areas remain underexplored, indicating the need for more detailed and experimental research work. Overall, this research study provides a comprehensive overview of current research trends and emphasizes the importance of further investigation to better understand the interaction between the menstrual cycle and exercise for improving women's health and sports performance.

Keywords: Menstrual cycle, Physiotherapy, Physical Activity, Sports Performance Dysmenorrhea and Bibliometric Analysis.

Background: -

The menstrual cycle (menstruation) in women begins with the onset of puberty, this is a time when fluctuations and irregularities in this cycle are quite common. Under normal circumstances, this cycle remains regular and typically lasts between *24 and 38* days. During each cycle, menstruation occurs, involving bleeding that usually continues for approximately 5 to 8 days. The volume of blood loss during this phase typically ranges from 5 to 80 mL (Onieva-Zafra et al., 2020). Increased attention is now being directed toward the performance of female athletes, particularly regarding how the menstrual cycle influences physiological changes during training. Fluctuations in the levels of key hormones such as estrogen and progesterone throughout this cycle play a pivotal role in regulating protein metabolism and muscle recovery, which can ultimately impact exercise outcomes *(Kissow et al., 2022)*. The natural hormonal fluctuations that occur during the menstrual cycle as well as hormones

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introduced into the body through contraceptive pills can affect exercise performance. The female reproductive system functions through a complex hormonal network this network not only regulates reproductive functions but also influences metabolism, which, in turn, can impact physical activity and performance *(Peinado et al., 2021)*. Exercise is considered beneficial for overall health and is often recommended as a natural method for relieving primary dysmenorrhea (menstrual pain) *(Armour et al., 2019)*. Female athletes often go through training and competitions while dealing with hormonal changes that occur during the menstrual cycle or from the use of hormonal contraceptives.

In addition, issues such as irregular menstrual cycles or missed periods are quite common among athletes and are seen more frequently than in the general population (Ekenros et al., 2022). Exercising at least three times a week for approximately 45 to 60 minutes each session, regardless of intensity can significantly reduce the severity of menstrual pain (Pattanittum et al., 2016).

Bibliometric analysis is a quantitative technique use to study recent patter and changes in academic research work over time. It helps researcher's academician and policymakers understand how a particular field is growing by identifying key trends, major contribution, and emerging areas of interest (Scarr & Jagnoor, 2021). Major citation database such as PubMed, google scholar and web of science bring together reliable academic studies from a wide range of disciplines, including the humanistic and social science arts and scientific field.

These platforms make it easier for researches to find trustworthy and peer-reviewed work helping them stay informed about development across different areas of knowledge (Kumar et al., 2025).Key-word analysis helps researches understand how keywords in academic studies are connected by examine how after they appear together. Tools like Vos Viewer display this relationship as simple network maps, where keywords are shown as nodes linked to each other (Hassan & Duarte, 2024). When supported by domain expertise, bibliometric analysis offers a practical way to understand how research is evolving. It helps identify publication trends, key contribution, active countries, and the most influential studies in a given field (Ahmad et al., 2021).

Methods for Research Work

Data Collection: - This study adopted a bibliometric approach to review the literature related to the menstrual cycle and physiotherapy. Relevant records were collected from PubMed, a well Established database for biomedical and health sciences research. This search was conducted on March 20, 2026, using the keyword phrase "menstrual cycle and physiotherapy. Initially, 352 records were identified. Upon limiting the results to publications from the past five years, this number decreased to 120. Further refinement using the full text filter narrowed the dataset to 65 studies, and applying the human filter yielded a final sample of 44 articles.

Data Preparation for analysis: - The collected records were exported in a format suitable for bibliometric analysis. Since the main aim of the study was to understand the overall research landscape, all 44 publications were kept for analysis without applying any further inclusion or exclusion criteria.

Analysis of Data: - This study used VOS viewer to analyse and visualize the data. Keyword co-occurrence analysis helped identify key research themes, while network maps showed how keywords were related based on their frequency and connections.

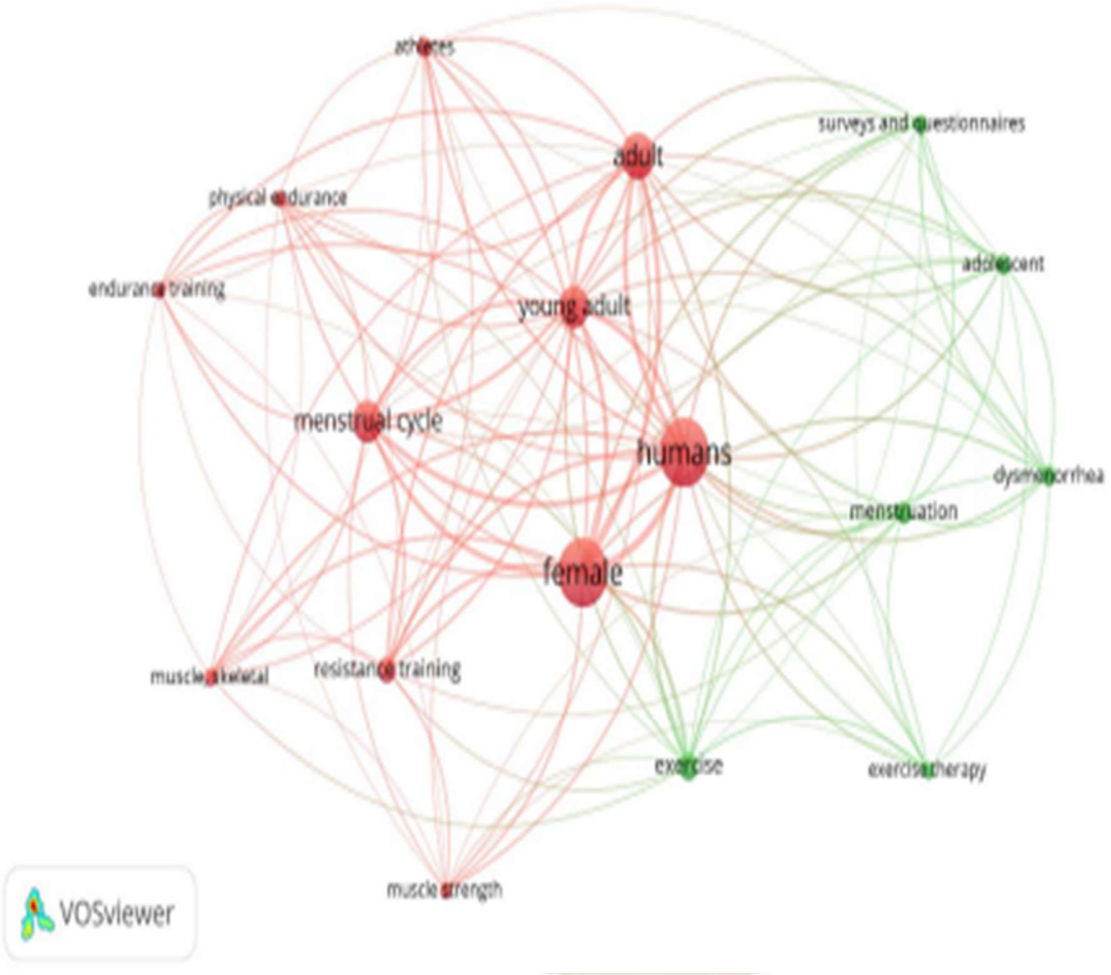
Results of the Research work: -

Table -1: Co-occurrence of the keywords associated with menstrual cycle and physiotherapy research.

S. No.	Keywords	Occurance	Total Link Strength
1	Female	44	207
2	Humans	44	207
3	Adult	25	149
4	Young Adult	22	137
5	Menstual Cycle	22	111
6	Exercise	12	71
7	Resistance Traning	11	64
8	Menstruation	9	51
9	Adolcent	8	50
10	Athlete	8	45
11	Survey and Questionnares	7	44
12	Dysmenorrhea	8	43
13	Physical Endurance	6	40
14	Endurance Training	6	39
15	Muscle, Skeletal	7	38
16	Exercise Therapy	6	33
17	Muscle Strength	6	31

Table 1 present how different keywords are used together in research on the menstrual cycle and physiotherapy. It highlights both how often each term appears and how strongly it is connected with other keywords. The terms female and humans appear the most and have the strongest connections, which means that most studies in this field focus on human female participants and link these terms with many other topics. Keywords like adult and

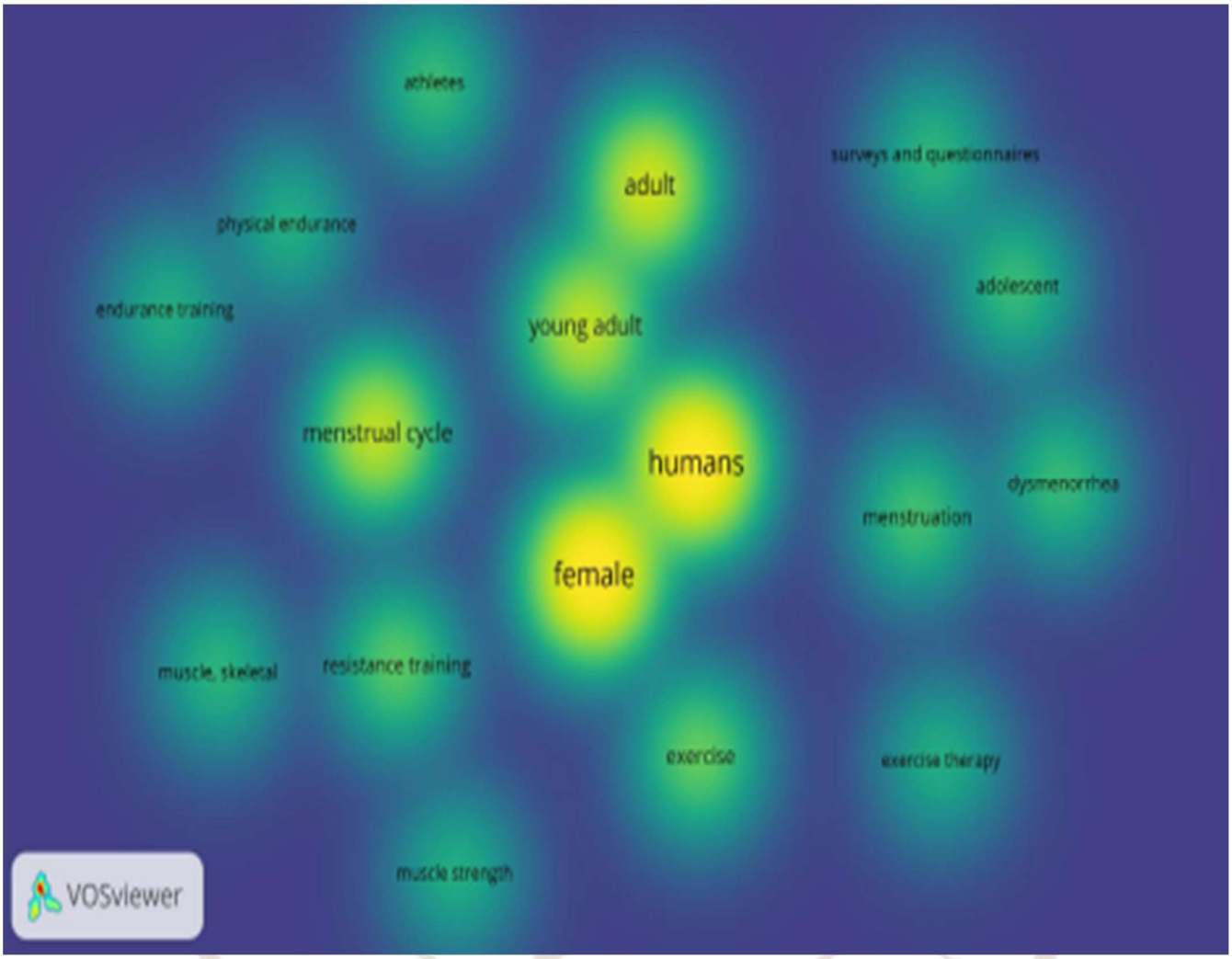
young adult suggest that a large number of studies are conducted on these age groups. The term menstrual cycle also appears frequently, confirming that it is the main focus of the research. At the same time, keywords such as exercise, resistance training, endurance training, physical endurance, and muscle strength show that researchers are increasingly studying the role of physical activity in relation to the menstrual cycle. Health-related terms like menstruation and dysmenorrhea indicate a focus on menstrual health issues, while the presence of athlete shows that some studies are specifically related to sportswomen. The keyword survey and questionnaires suggest that many researchers collect data through self-reported methods. The table makes it clear that most research in this field focuses on female populations and explores the connection between menstrual health and physical activity.



The figure: -1 Network visualization of menstrual cycle and physiotherapy research: A Network Analysis of Co-Occurring Keywords (Source: Prepared by Author using VOS viewer 1.6.19 software).

The network visualization of these keywords. In this figure, each keyword is represented as a point, and the lines between them show how often they appear together in the same studies. Bigger points represent keywords that appear more frequently, while thicker lines show stronger relationships between them. The keywords are also grouped into clusters, which represent related themes. For example, some clusters focus on population characteristics, others on exercise and training, and some on menstrual health. This figure helps to easily

understand how different topics in this field are connected with each other.



The figure: -2 Density visualization of menstrual cycle and physiotherapy research: A Network Analysis of Co-Occurring Keywords (Source: Prepared by Author using VOS viewer 1.6.19 software)

The density visualization of the same data. This figure shows which areas of research are more active and which are less explored. Brighter areas represent keywords that appear more often and have stronger connections, while darker areas represent less frequently studied topics. Keywords like female, humans, and menstrual cycle appear in the brightest areas, showing that they are the main focus of research. Topics related to exercise and performance appear in moderately bright areas, indicating growing interest. Less bright areas suggest topics that need more research in the future. This figure helps to identify the main focus areas as well as possible research gaps in the field.

Discussion of Findings:

The findings of the research study present that research work on the menstrual cycle and physical activity is

steadily growing, with a clear focus on women, especially adults and young girls. Most research studies explore how hormonal changes during the menstrual cycle affect the body, particularly in relation to physical activity and complete health. The frequent appearance of keywords related to exercise, such as resistance training, endurance, and muscle strength, suggests that researchers are increasingly interested in understanding how physical activity interacts with menstrual health with woman athletes. At the same time, issues like menstruation and dysmenorrhea remain important areas of concern, as many women experience discomfort during their cycle and look for natural ways, such as physical activity, to manage it. The presence of athlete-related terms also display that this area is highly relevant in sports, where performance may be influenced by hormonal changes and, in some cases, menstrual irregularities in female athletes.

The visual analysis further supports these research findings by presenting that core topics like female health and the menstrual cycle are strongly and significantly connected with exercise related themes, while some fields are still less explored. This indicates that although the field is developing, there are still gaps that need more detailed research work. Many studies rely on surveys and questionnaires, which help in understanding personal experiences but may lack accuracy. Therefore, future research should include more scientific and experimental approaches. Overall, the present research study highlights that the relationship between the menstrual cycle and physical activity is complex, and a deeper understanding is needed to support women's health and sports performance in a better way.

Conclusion:

This research study shows that the important connection between the menstrual cycle and physical activity is an important and growing area of research work. Most of the existing studies focus on how hormonal changes affect sports performance, recovery, and overall health in women specially athletes. Exercise is generally seen as beneficial and may help in reducing menstrual discomfort, but its exact effects are still not fully clear and need further investigation. The research findings also point out that female athletes may experience additional challenges, such as irregular cycles, which makes it even more important to study this fields in detail. Overall, this research helps in understanding current trends and identifying areas where more research work is needed. Future studies should focus on developing clearer guidelines on how physical activity and exercise can be adjusted according to different phases of the menstrual cycle. This will not only improve scientific knowledge but also help in designing better sports training and programs related to health for women athletes.

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