



P-ISSN: 2394-1685
E-ISSN: 2394-1693
Impact Factor (R,JIF): 5.38
IJPESH 2023; 10(6): 345-349
© 2023 IJPESH
www.kheljournal.com
Received: 20-09-2023
Accepted: 25-10-2023

Dr. Navneet Dhadda
Assistant Professor, Department
of Physical Education, HMV,
Jalandhar, Punjab, India

Dr. Mandeep Singh
Assistant Professor, Govt. Arts
and Sports College, Jalandhar,
Punjab, India

Dr. Kanwar Mandeep Singh
Assistant Director, Directorate of
Sports, Guru Nanak Dev
University, Amritsar, Punjab,
India

Dr. Parminder Singh
Assistant Professor, Department
of Physical Education, Guru
Nanak Dev University,
Amritsar, Punjab, India

Corresponding Author:
Dr. Kanwar Mandeep Singh
Assistant Director, Directorate of
Sports, Guru Nanak Dev
University, Amritsar, Punjab,
India

Relationship of menstrual distress, anxiety and depression with performance among female basketball players

Dr. Navneet Dhadda, Dr. Mandeep Singh, Dr. Kanwar Mandeep Singh and Dr. Parminder Singh

DOI: <https://doi.org/10.22271/kheljournal.2023.v10.i6e.3190>

Abstract

The purpose of the study was to examine the relationship between basketball performance, menstrual distress, depression and anxiety during premenstrual phases among the university level female basketball players. A total of 70 female basketball players were purposively selected as subjects from different colleges of Guru Nanak Dev University, Amritsar. The Menstrual Distress Questionnaire (MDQ) was used to assess menstrual distress among female basketball players. Johnson Basketball Test Battery was used to measure the performance of the basketball players. The anxiety level of the female basketball players was examined by the Sports Competition Anxiety Test (SCAT) and depression was measured by using the Beck Depression Inventory (BDI). The correlation analysis showed that the basketball performance of female basketball players did not show a significant association with menstrual distress, depression and anxiety during the premenstrual phase. Menstrual distress showed a significant association with depression ($p < 0.05$) and anxiety ($p < 0.05$) among basketball players during the premenstrual phase. The menstrual distress sub-variable negative effect, water retention and arousal showed a significant association with anxiety during the premenstrual phase. In conclusion, the performance of female basketball players was not associated with menstrual distress, depression, and anxiety during the premenstrual phase.

Keywords: Basketball players, menstrual distress, depression, anxiety, menstrual cycle, performance

Introduction

Menstruation is a basic physiological phenomenon of usual sexual and reproductive function. The menstrual cycle is a complex physiological occurrence¹. Although no physical and physiological changes before or during menstruation in some females, others experienced severe changes^[1]. Premenstrual symptoms are recurring disorder that happens in the luteal phase of menstrual cycle. It is characterized by intense physical, psychological, and behavioral changes that disrupt interpersonal relationships and the lives of affected women^[2]. Premenstrual symptoms are used to cover symptoms linked to either or both the premenstrual or menstrual phases and to recognize the likely existence of several syndromes with different bio-psychosocial aetiologies^[3]. The complaints include emotional instability, depression, anxiety, irritability and impulsivity, a sense of bloating, breast tenderness, fatigue, and changes in appetite. Halbreich^[4] described various proposed aetiologies of premenstrual syndrome, one of the aetiologies of premenstrual syndrome is that it is cyclist and variation of hormones in the menstrual cycle, leading to premenstrual syndrome. Berga^[5] reported that almost 40% of females had mild to moderate pre-menstrual symptoms. Saddock and Saddock^[6] exposed that depressive disorder, dysthymia; generalized anxiety disorder and bipolar disorder were most commonly linked with premenstrual symptoms.

Complex relationships were reported between the menstrual cycle, associated hormonal fluctuations, health, well-being and sporting performance^[7-10]. Although some female athletes feel a decrease in their physical capacity during the menses, however, many athletes produced medal-winning performances even in the Olympic Games during all portions of the menstrual cycle^[11, 12].

In another study, Bruinvels [13] reported that half of elite British female runners and rowers felt that their menstrual cycle had in some way impacted their training and sporting performances. Lithy [14] described that some of the previous observational studies reported that the associations between physical activity and premenstrual syndrome had demonstrated unreliable answers. Studies also found higher levels of premenstrual symptoms between females who exercised more compared to low-exercising females [15, 16]. Exercise has not been shown to either cure or aggravate painful menstruation, but it has been shown to relieve menstrual cramps because of improved circulation to the uterus. The decrease in menstrual cramps could also be related to increased levels of endorphins produced during prolonged physical activity that may counteract pain [17]. Some females say that their pain decreased when they exercised regularly [18].

Depression associated with premenstrual syndrome has been described usually as involving more anxiety, agitation, and mood lability than miserable change [19]. Banerjee *et al.* [20] and Yonkers [21] said that 30-76% of women with premenstrual dysphoric disorder had a history of depression. Both depression and premenstrual dysphoria had bilateral bad contact with each other. Ionelli [22] reported the association between premenstrual signs and depression, anxiety and stress. Mortie [23] observed that premenstrual syndrome demonstrated depressive experiences that occurred selectively in the luteal phase of the cycle at least 1 or 2 subsequent somatic and affective symptoms appeared during the 5 days before menses.

Anxiety as an emotional response plays a major role in almost all gynaecological problems, manifested both behaviourally and physiologically. Anxiety is experienced as an anticipated fear or feeling of threat in apprehension [24]. It is also defined in terms of perceived signal of danger which mobilizes the human organism's resources to counter the threat [25]. It leads to disorganization and is observed as a disturbance of human functioning. It is true that anxiety has many facets and may be expressed as feelings of vague, uneasiness, fear, anger, restlessness and irritability [26].

The present study was undertaken to examine menstrual distress, depression and anxiety in the premenstrual phase among female basketball players. The study aimed to ascertain the relationship between menstrual distress and other psychological conditions such as depression and anxiety arising due to menstrual distress in the premenstrual phase. The study also assessed the relationship of menstrual distress and selected psychological variables with the performance of female basketball players.

Methodology: A cross-sectional survey-type study was designed to examine the association of menstrual distress, basketball performance, depression and anxiety during the premenstrual phase of the menstruation cycle. A purposive sampling technique was adopted for the selection of subjects. A total of 70 female basketball players were selected from various colleges affiliated to Guru Nanak Dev University, Amritsar. The age of the female basketball players was ranged from 18 to 25 years. Basketball performance, menstrual distress, anxiety and depression levels were examined among female basketball players during the premenstrual phase of the menstruation cycle.

Basketball Performance: The Johnson basketball skill test was used to measure the basketball performance of female players. The Johnson Basketball Test Battery was developed by Johnson [27] and this test battery measures the performance of players on different basketball skills. Johnson Basketball Test Battery consists of the following three items

1. Field Goal Speed Test
2. Basketball Throw for Accuracy
3. Dribble.

Menstrual Distress Questionnaire (MDQ)

Menstrual Distress Questionnaire (MDQ) was developed by Moos [28]. This questionnaire was used to investigate the behavior and emotional response of young girls during the menstrual cycle. In the menstrual distress questionnaire, subjects rate their symptoms using a five-point likert type scale (0-4) ranging from "no experience of symptoms" to "very severe" over 47 statements. Each subject made these ratings separately for the menstrual (pre-menstruation, during menstruation, the remainder of the cycle) phases of her most recent menstrual cycle. The eight scales of the menstrual distress questionnaire are pain, water retention, autonomic reaction, negative affect, impaired concentration, behavioral change, arousal and control. The score of each scale was calculated separately, and then the total score was calculated by adding scores of all eight scales.

Beck Depression Scale (BDI)

This scale was developed by the Beck [29]. It is the most widely used self-scored standardized screening tool to measure depression. Beck Depression Inventory had 21 statement items that were related to a person's past, present and future experiences and expectations ranged from 0 to 3. The total scoring of the depression was categorized at different levels of depression. A score of 1-20 indicates the normal level of depression; a score between 21 to 30 indicates moderate level of depression, the score ranges of 31-40 shows severe level of depression and over 40 score indicates that the level of depression is extreme.

Sports Competition Anxiety Test (SCAT)

This scale was developed by Rainer Martens [30] was used to measure the sports competition anxiety Test. Sports Competition Anxiety Test contains 15 items, which include five false items, eight positive items, and other two items with negative responses. Each item on the sports competition anxiety test had three likely responses i.e. (a) Rarely (b) Sometimes (c) Often. The item no. 2, 3, 5, 6, 8, 9, 11, 12, 14, 15 measure the symptoms associated with anxiety. The item no.1, 4, 7, 10 and 13 are five spurious questions and are not scored.

Statistical Analysis

SPSS 16.0 (Statistical Package for Social Science Inc., Chicago, Illinois USA) software was used to perform statistical analyses. The data in the present study was presented as descriptive statistics such as mean, standard deviation etc. The Karl Pearson Product Moment coefficient of correlation was used to examine the associations among various variables. The significance level adopted was 0.05.

Results

Table 1: Descriptive statistics of basketball performance, depression, anxiety and menstrual distress of basketball players during the premenstrual phase

Variables	Mean (N=70)	Standard Deviation (SD)
Basketball Performance	40.52	6.59
Depression	24.55	9.74
Anxiety	21.61	6.62
Menstrual Distress	89.72	27.57
Pain	14.68	6.55
Concentration	15.74	8.80
Behavior	8.28	4.27
Automatic Reaction	7.68	4.78
Water Retention	7.00	4.77
Negative Affect	17.54	8.02
Arousal	10.15	5.17
Control	9.12	6.14

Table 2: Associations of basketball performance, depression and anxiety with menstrual distress during premenstrual phase among the female basketball players

Variables	Basketball Performance		Depression		Anxiety	
	correlation coefficient (r)	p-value	correlation coefficient (r)	p-value	correlation coefficient (r)	p-value
Menstrual Distress	-0.072	0.553	0.326	0.006*	0.299	0.012*
Pain	-0.032	0.793	0.122	0.315	0.234	0.052
Concentration	-0.165	0.173	0.270	0.024*	0.072	0.553
Behavior	0.017	0.888	0.153	0.206	0.166	0.171
Automatic Reaction	0.024	0.846	0.197	0.102	0.045	0.714
Water Retention	0.120	0.324	0.078	0.521	0.248	0.038*
Negative Affect	0.021	0.863	0.167	0.166	0.275	0.021*
Arousal	-0.036	0.770	0.216	0.073	0.244	0.042*
Control	-0.125	0.301	0.138	0.255	0.038	0.756

*Indicate $p \leq 0.05$.

Table 1 presents the descriptive statistics of basketball performance, depression, anxiety, and menstrual distress of basketball players during the premenstrual phase. The relationship of menstrual distress with basketball performance, depression and anxiety among the female basketball players of various colleges affiliated to Guru Nanak Dev University, Amritsar is presented in table 2. The correlation analysis revealed that menstrual distress was significantly associated with depression ($r=0.326$, $p=0.006$) and anxiety ($r=0.299$, $p=0.012$) among female basketball players. Menstrual distress sub-variable concentration was significantly associated with depression ($r=0.270$, $p=0.024$) among the female basketball players. Menstrual distress sub-variables i.e. water retention ($r=0.248$, $p=0.038$) negative affect ($r=0.275$, $p=0.021$) and arousal ($r=0.244$, $p=0.042$) showed significant association with anxiety among the basketball players.

Table 3: Associations of basketball performance with depression and anxiety during the premenstrual phase among female basketball players

Variables	Basketball Performance	
	Correlation Coefficient(r)	p-value
Depression	-0.018	0.883
Anxiety	-0.017	0.886

The relationship of basketball performance with depression and anxiety during the premenstrual phase among female basketball players is presented in Table 3. The correlation analysis revealed that basketball performance did not

demonstrate significant associations with depression and anxiety during the premenstrual phase among the female basketball players.

Discussion

The present study focuses on evaluating the menstrual distress, anxiety, depression and basketball performance among college-level female basketball players. The associations of menstrual distress, anxiety, depression and basketball performance among female basketball players were examined. The findings of the present study showed that menstrual distress had a significant association with depression and anxiety among basketball players. These findings conform to many previous studies. Ionelli [22] reported in his study that a positive correlation existed between premenstrual signs and depression, anxiety and stress. Another study conducted by Mortie [23] showed that premenstrual syndrome demonstrated depressive experiences that occurred selectively in the luteal phase of the cycle. At least 1 or 2 subsequent somatic and affective symptoms appear during the 5 days before menstruation cycle. Partoazam [31] revealed that menstruation generally occurs during the reproductive life of the female, up to 90% of females experience more signs during the days before menses, and almost all components of female normal functioning can have positive or negative variations of the menstruation cycle. The findings of the present study revealed that basketball performance did not show any significant relationship with menstrual distress and psychological conditions arising out of it viz. depression and anxiety among basketball players in the

premenstrual phase. While studying the effects of the menstrual cycle on performance it was observed that some researchers reported negative effects [32]. However, some researchers did not report any negative effects on performance [33]. The relationships between the menstrual cycle and sporting performance are very complex as reported in various previously conducted studies [7-10]. Many athletes reported negative effects of the menstruation cycle on their performance; however, medal-winning performances have been seen in the Olympic Games by athletes during all portions of the menstrual cycle [11, 12]. No negative effect of the menstrual cycle on performance was reported by 37% of the athletes who participated in the 1964 Olympic Games [1]. Choi and Salmon [34] revealed the positive effects of exercise on mood states and premenstrual and menstruation cycle. Lebrun [35] studied the effects of the menstrual cycle phase on athletic performance tests *viz.* aerobic capacity, anaerobic capacity, isokinetic strength, and high-intensity endurance and reported that the menstrual cycle did not impact significantly on the majority of the performance tests and cardio-respiratory variables. Turkmen [36] also reported that the menstrual cycle period did not negatively affect the performance indices (vertical jump, 20 m sprint, reaction time, and hand grip strength) among athletes. In another study, Kin [1] investigated the athletes about effect of the menstrual cycle on performance and 50.49% of the athletes reported that their performance was not affected, 49.51% of the athletes reported effect on performance. Reer [37] found in his study that 70% of the athletes had the same or better performance and 30% of the athletes performed worse. Female athletes who reported poorer performance during menstruation were mostly from endurance sports (tennis players and rowers). Volleyball, and basketball players, swimmers and gymnasts performed better than the endurance athletes but were still below normal levels. Track-and-field athlete's performance especially sprinters were not affected much by menstruation as were the performances of other athletes. Gold-medal winning performances have been observed in swimming and track and field [11]. Ozdemir and Kucukoglu [38] reported that speed and endurance were not affected by the menstrual period if athletes had no pain. Bayram [39] compared the PMS symptoms of basketball players and sedentary females and found the PMS scores of sedentary females significantly higher at each of the three menstrual, premenstrual and inter-menstrual phases. Gannon [40] revealed the potential role of exercise in the alleviation of the menstrual cycle and menopausal symptoms *i.e.* dysmenorrhea and premenstrual syndrome.

Conclusion

In conclusion, it was observed from the findings of the study that the performance of basketball players was not affected by menstrual distress and other psychological factors *viz.* depression and anxiety during the premenstrual phase. Menstrual distress showed an association with depression and anxiety during the premenstrual phase among female basketball players. Menstrual distress sub-variable concentration showed a positive association with the depression during premenstrual phase. These findings must be kept in mind regarding the menstrual cycle and psychological parameters while planning the training schedules for performance enhancement for female basketball players.

References

1. Kin A, Yegul I, Cilli M. Comparison of some features of

- women with and without sportsmen the menstruation. Gazi physical education and sports sciences 1st congress proceeding; c2000. p. 159-164.
2. Greene R, Dalton K. The premenstrual syndrome. *Br Med J*; c1953. p. 1007-1014.
 3. Moos RH. The development of a menstrual distress questionnaire. *Psychosom Med.* 1987;49(5):853-867.
 4. Halbreich U. Anxiety disorder in women development and life cycle perspective. *Depress Anxiety.* 2003;17:107-110.
 5. Berga SL, Parry BL, Cyranowski JM. Psychiatry and Reproductive Medicine. In *Comprehensive Textbook of Psychiatry.* BJ Sadock, VA Sadosk. Philadelphia, Lippincott Williams & Willkins; c2005. p. 2293-2315.
 6. Saddock VA, Saddock BJ. Psychiatry & Reproductive Medicine, Kaplan and Saddock's Synopsis of Psychiatry; c2011. p. 867-68.
 7. Constantini NW, Dubnov G, Lebrun CM. The menstrual cycle and sports performance. *Sports Med.* 2005;35(7):51-82.
 8. Mountjoy M, Sundgot-Borgen J, Burke L. The IOC consensus statement beyond the female athlete triad relative energy deficiency of sports (RED-S). *J Sports Med.* 2014;48(4):1-7.
 9. Aganoff JA, Boyle GJ. Aerobic exercise, mood states and menstrual cycle symptoms. *J Psychosom Res.* 1994;38(1):83-92.
 10. Lebrun CM, Joyce SM, Constantini NW. Effect of female reproductive hormones on sports performance. In: Constantini N, Hackney AC, eds. *Endocrinology of physical activity and sports.* 2nd ed. New York: Springer Science and Business Media; c2013. p. 281-322.
 11. Fox LE, Bowers RW, Foss ML. The physiological basis of physical education and athletics, U.S.A; c1988. p. 379-386, 553-569.
 12. Fleck S, Kraemer W. Designing resistance training programs. *Human Kinetics, Second Edition*; c1990. p. 193-197.
 13. Bruinvels G, Burden R, Brown N. The prevalence and impact of heavy menstrual bleeding (menorrhagia) in elite and non-elite athletes. *PLoS One.* 2016;11:81-89.
 14. Lithy A, Mazny A, Sabbour A, Deeb A. Effect of aerobic exercise on premenstrual symptoms haematological and hormonal parameters in young women. *J Obstet Gynaecol*; c2014. p. 1-4.
 15. Deuster P, Adera T, South-Paul J. Biological, social, and behavioral factors associated with premenstrual syndrome. *Arch Fam Med*; c1999, 8(2).
 16. Rasheed P, Sowielem AL. Prevalence and predictors of premenstrual syndrome between college-going females. *Ann Saudi Med.* 2003;2(3):381-387.
 17. Hoeger WWK, Hoeger SA. *Fitness and wellness.* Boise State University. Morton Publishing Company; c1990, 175.
 18. Shangold M. *Sports medicine for women.* Meyer and Verlag; c1990. p. 113-134.
 19. Endicott J, Halbreich U. Clinical significance of premenstrual dysphoric changes. *J Clin Psychiatry.* 1988;49:486-489.
 20. Banerjee N, Roy KK, Takkar D. Premenstrual dysphoric disorder on research from India. *Int. J Fertil Womens Med.* 2000;4(5):342-344.
 21. Yonkers KA. The relationship among premenstrual dysphoric disorder and other mood disorders. *J Clin Psychiatry.* 1997;5(8):19-25.

22. Ionelli CO. External locus of control orientation as a moderator between depression, anxiety, and premenstrual symptomatology. United States: Fielding Graduate University; c2010.
23. Mortole J. Study of the menstrual pattern of college girls of Poona. *Indian J Obstet Gynaecol.* 1986;161(6):1682-1687.
24. Sharma HK. Study of anxiety in married and unmarried university teachers. Paper presented at the Seminar on Anxiety, Dept. of Psychology, B.H.U, Varanasi; c1985 Nov 15-17.
25. Basowitz H, Perky H, Korchin SS, Grinker RR. *Anxiety and Stress: An Interdisciplinary Study of a Life.* New York: McGraw-Hill; c1955.
26. Jersild A, Brook J, Brook DW. *The psychology of adolescence.* Third ed. McMillan Pub., New York; c1978. p. 226-229.
27. Kansal DK. *Test and Measurement in Sports and Physical Education.* DVS Publications, New Delhi; c1996.
28. Moos RH, Kopell BS, Melges FT, Yalon ID, Lunde DT, Clayton RB, *et al.* Fluctuations in symptoms and moods during the menstrual cycle. *J Psychosom Res.* 1969;13:37-44.
29. Beck AT. *Depression: Clinical, Experimental and Theoretical Aspects.* New York: Harper & Row; 1967.
30. Martens R. *Sports Competitive Anxiety Test.* Champaign III: Human Kinetics; c1977.
31. Partoazam H, Mokhtari L. Investigation of frequency and intensity of depression among female high school students in Khoy. *Bimonthly J Urmia Nurs Midwifery Fac.* 2009;7:90-93.
32. Wilson CA, Abdenour TE, KeyeWR. Menstrual disorders among intercollegiate athletes and non-athletes: Perceived impact on performance. *Athl Train JNATA.* 1991;26:170-177.
33. Quadagno D, Faquin L, Lim GN, Kuminka W, Moffet R. The menstrual cycle: Does it affect athletic performance? *Phys Sports Med.* 1991;19(3):121-124.
34. Chio PY, Salmon P. Stress responsivity in exercisers and non-exercisers during different phases of the menstrual cycle. *Soc Sci Med.* 1995;41(6):769-777.
35. Lebrun CM, Kenzie MC, Prior JC, Taunton JE. Effect of menstrual cycle phase on athletic performance. *Med Sci Sports Exerc.* 1995;27(3):437-444.
36. Turkman L. Examination of some physiological parameters after menstrual, menstrual D important and menstrual in young sports women. Note all note may university SA Glyt science enstit USBody E and sports department Yuksek undergraduate thesis. Samsun; c2000.
37. Reer R. *Physiological and Medical Aspects of training and training therapy.* Institute for sports and exercise medicine University Hamburg; c1991, 39.
38. Ozdemir R, Kucukoglu P. The effect of menstruation on face and resistance in female athletes. *J Sports Sci.* 1993;4(4):3-9.
39. Bayram GO. A Comparison between sportswomen and sedentary women with sedentary women with regard to premenstrual symptoms. *Bakirkoy Med J.* 2007;3(3):104-110.
40. Gannon L. The potential role of exercise in the alleviation of menstrual disorders and menopausal symptoms: A theoretical synthesis of recent research. *Women Health.* 1988;14(2):105-127.