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**Influence of Menstrual Symptoms on Sports Performance of Female Athletes in Borno State**

**Abdulsalam, A. <sup>(1)</sup> & Mohammed AbdullahiMshelia <sup>(2)</sup>**

**Department of Physical and Health Education, University of Maiduguri, Borno State<sup>(1&2)</sup>**

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**Abstract**

The effect of menstrual symptoms on the sports performance of female athletes in Borno State was examined in this study to understand the influence of menstrual-related factors on athletic abilities. A survey research design was adopted for this study, focusing on female athletes from two tertiary institutions in Borno State. The researchers developed a questionnaire to assess the impact of menstrual symptoms on sports performance. A Likert scale was employed to measure participants' agreement with specific statements related to menstrual symptoms and their effect on athletic performance. The study involved 87 female athletes who had participated in competitions. The one-sample t-test was employed to analyze the data collected. The findings revealed that the mean score (3.012) of the participants significantly exceeded the preset constant mean score (2.50), indicating that menstrual symptoms significantly affect the sports performance of female athletes in Borno State ( $t = 5.125$ ,  $df = 86$ ,  $p < 0.001$ ). The probability of obtaining such a result by chance was found to be negligible, the rejection of the hypothesis stating no significant effect of menstrual symptoms on sports performance. Therefore, there is no significant effect of menstrual symptoms on sports performance of female athlete in Borno State. The study recommends collaborative efforts between exercise scientists and healthcare providers to develop interventions for managing menstrual symptoms and optimizing sports performance. Implementing a menstrual cycle tracker system was also suggested to facilitate early identification of potential issues and promote appropriate management strategies for female athletes.

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**Introduction**

The menstrual cycle is complex and is influenced by a variety of factors, including hormonal, physical, and psychological changes. It is not uncommon for female athletes to experience menstrual symptoms that can negatively affect their performance. Research has shown that menstrual symptoms can lead to decreased strength, endurance, reaction time, and overall performance in women's sports (Jouzi et al., 2019). Menstruation is a natural monthly occurrence for most females, but it can negatively impact athletic performance. During menstruation, women commonly experience

symptoms like cramps, bloating, headaches, nausea, and fatigue due to changes in hormone levels (Matthewman, Lee, Krockmalnic, & Wigley, 2018). These symptoms vary in severity across individuals – while some women have minor discomfort, others suffer from more debilitating pain and disrupted daily functioning (Iacovides, Avidon, & Bentley, 2014). Athletes are not immune to these effects.

Physical symptoms such as abdominal cramps, bloating, headaches, and fatigue can significantly impact the performance of athletes. During the menstrual cycle, estrogen and progesterone levels fluctuate, leading to changes in water retention, electrolyte balance, and muscle function (Jouzi et al., 2019). The loss of blood during menstruation can also cause a decrease in iron levels, leading to anemia, which can contribute to fatigue, reduced aerobic capacity, and poor endurance. These symptoms can negatively affect women's ability to maintain peak performance during training and competition. In addition to physical symptoms, menstrual cycles can also bring about a range of psychological symptoms. Women may experience mood swings, anxiety, irritability, and depression which not only affect their performance but also their quality of life. The effect of these symptoms on sport performance can be profound, as they can lead to reduced motivation, concentration, and confidence (Jouzi et al., 2019).

Studies show that female athletes across various sports frequently report poorer quality training and impaired performance during menses compared to other phases of their cycle (McNulty, Elliott-Sale, Dolan, Swinton, Ansdell, Goodall et al., 2020). Factors such as reduced aerobic capacity, decreased muscle strength, altered neuromuscular control, and greater perceived effort have been observed during menstruation (Julian, Hecksteden, Fullagar, & Meyer, 2017). Additionally, conditions like premenstrual syndrome (PMS) and dysmenorrhea, which involve more severe symptoms in the days preceding and during menses, have heightened impacts on athletes (Marvan, Diaz-Erosa, Cortes-Iniestra, & Gonzalez-Alonso, 1997).

## **Hypothesis**

Menstrual symptoms have no significant influence on sports performance of female athlete in Borno State.

## **Methodology**

Survey research design was adopted for this study. The target population for this study was all female athletes in two tertiary institutions, that is, University of Maiduguri and Ramat Polytechnic with population of eighty seven (87). Purposive sampling was used to select female athletes that have participated in any competitions. Convenient sampling was used to select all the female athletes in two tertiary institutions in Borno State. The research instrument for this study was researchers' developed questionnaire named "Effect of Menstrual Symptoms on Sports Performance of Female Athletes" having modified likert scale of Strongly Agreed, Agreed, Disagreed and Strongly Disagreed with scoring mode of 4, 3, 2 and 1 respectively. Face and content validity was carried out by experts in exercise physiology. Split half reliability method was conducted for study with reliability coefficient of 0.83. Data collected were analysed using descriptive statistics of frequency, percent, mean and standard deviation while inferential statistics of one sampled t-test to test the

formulated hypothesis, at 0.05 level of significance using the Statistical Package for Social Sciences (SPSS v27)

## Result

**Table 1: Demographic characteristics of the respondents**

Age (Years)	Frequency	Percent
16-20	18	18%
21-25	23	23%
26-30	34	34%
31 above	12	12%
Number of competitions		
1-2	26	26%
3-4	23	23%
5-6	21	21%
7 above	17	17%
Total	87	100%

Table 1 provides information on the age range, from the table, we can see that the largest age group is 26-30, accounting for 34% of the total number of people in the sample. This indicates that there may be more opportunities or interest in participating in competitions within this age group compared to other age groups. In terms of the number of competitions participated in, the majority of people (26%) participated in 1-2 competitions. The percentage decreases as the number of competitions increases, with only 17% of people participating in 7 or more competitions.

**Table 2: One sampled t-test summary on effect of menstrual symptoms on sports performance of female athlete**

Variables	N	Mean	Std. Deviation	Std. Error	df	T	Prob
effect of menstrual symptoms on sports performance	87	3.012	0.858	0.12592	86	5.125	0.001
Constant Mean		2.50					

( $t=5.125$ ,  $df=86$ ;  $P<0.0001$ )

Table 2 presents a one-sample t-test summary for the effect of menstrual symptoms on the sports performance of female athletes in Borno State. The hypothesis tested in this analysis is whether menstrual symptoms have a significant effect on the sports performance of female athletes. To test this hypothesis, a constant mean score of 2.50 is set, and it is compared to the mean score of the participants (3.012). The t-value of 5.125 and the degree of freedom of 86 are calculated. The t-value indicates the difference between the mean score of the participants and the constant mean score in terms of the standard error. In this case, a large t-value of 5.125 indicates that the mean score of the

participants is significantly higher than the constant mean score, which suggests that menstrual symptoms do not have a significant effect on the sports performance of female athletes.

The probability value of the t-test is less than 0.001, indicating that the probability of obtaining such a result by chance is negligible. Therefore, the findings of the analysis confirm that the hypothesis of no significant effect of menstrual symptoms on the sports performance of female athletes in Borno State was rejected. In conclusion, the results of this analysis suggest that menstrual symptoms do have a significant impact on the sports performance of female athletes in Borno State

## **Discussion**

The finding of this study which shows that female athletes' performance are significantly affected by menstrual symptoms is a one that evokes concern. This is because menstrual flow is a natural phenomenon that is beyond the control of the female athletes and so can hardly be manipulated to suit the athletes period of competition. This finding corroborates previous similar studies. For instance, Lebrun et al. (1993) in their study involving female athletes reported that menstrual cycle-related symptoms, such as cramping, bloating, and mood changes, were associated with reduced athletic performance. Similarly, Thompson and Cullinan (2012) argued that menstrual cycle-related symptoms, such as tiredness, irritability, and mood swings, can negatively affect sports performance among female soccer players. Jenkins and Goldenberg (2001) found that female athletes performed better during the follicular phase of the menstrual cycle than during the luteal phase. Similarly, Oosthuysen and Bosch (2010) reported that females had decreased endurance performance during the menstrual and luteal phases of the menstrual cycle are in line with this study. The implication of menstrual cycle posing a hindrance to athletic performance of female athletes is that deserving athletes may be denied of their winning chances. This calls for serious interventions from dedicated researchers in the field of science.

On the other hand, some studies have found no significant relationship between menstrual symptoms and sports performance among female athletes. Jenkins and Goldenberg (2001), in a study involving female gymnasts and sprinters, reported no significant difference in sports performance between the menstrual and non-menstrual cycle periods. In another study involving highly trained female athletes, Shangold et al. (2010) reported no significant variation in sports performance during the menstrual cycle. Similarly, in a more recent study by Ostojic and Mazic (2020), it was found that menstrual symptoms had no significant effect on sports performance among female athletes. This finding represents hope for female athletes and is not concurrent with the findings of the present study.

## **Conclusion**

Based on the finding of the study, it is concluded that since menstrual symptoms negatively affect athletic performance among female athletes, the concerned athletes are therefore disadvantaged during competitions. This suggests the need for innovative interventions aimed at countering or cushioning the observed effects so as to ensure optimal performance for female athletes even in the face of menstrual symptoms.

## Recommendations

Based on the findings of this study, the following recommendations are made:

1. Exercise scientist and healthcare providers should collaborate to develop appropriate interventions that manage menstrual symptoms and optimize sports performance among female athletes. This may involve providing education on menstrual cycle-related symptoms and their impact on sports performance, as well as recommendations for managing symptoms, such as pain relief medication, hydration, and proper nutrition.
2. Establishing a menstrual cycle tracker system to enable athletes to track their menstrual cycle, including symptoms they experience, could identify potential issues early and encourage the athlete to take appropriate measures to manage the situation.
3. Coaches could consider scheduling training and competitions according to the menstrual cycle phases of female athletes, as some studies suggest that different menstrual cycle phases may affect sports performance differently.

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