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RESEARCH PAPER

# Assessing the difference Concerning Junk Food Consumption and Menstrual Health among Female Student-Athletes verses Student Non-Athletes in the University Setting

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**ABSTRACT**

The purpose of the study was to find out difference concerning junk food consumption and menstrual health among female student's athlete verses non-athlete's in the university setting in Lahore, Pakistan. A cross-sectional study was conducted among 340 girls, 170 athletes and 170 non-athletes ages between 18-25 years. Data collection Tools utilized for this study included demographic information, menstrual health and junk food consumption. The Statistical analysis was carried out by using independent T-Test. Results revealed that irregular menstrual cycle and pre-menstrual symptoms were significantly higher in non-athletes as compared to athletes and junk food consumption like carbonated drinks and refined grains were significantly higher in athletes than non-athletes. This study contributes to the understanding of menstruation and junk food consumption in a university setting. These findings may help professionals to formulate appropriate intervention strategies to counter menstrual problems and eating habits among female athletes and non-athletes in universities.

**KEYWORDS** Female Athletes, Junk Food, Menstruation, Non-Athletes, Public Universities

## Introduction

It has been suggested that the menstrual health of females has significant impact on physical, emotional, and social aspects of women's life and thought to be consider a crucial component of their well-being (Nakame, Kiwanuka, & Robert, 2019). It was suggested that complex hormonal interactions control the menstrual cycle, a physiological process that occurs naturally and assumed to be essential for reproductive health of the women (Schoeb et al., 2020). However, some researchers has been arguing that a number of factors, including nutrition and exercise might affect menstrual health (Armour, Parry, Steel, & Smith, 2020).

Particularly, in recent years junk food consumption has gained popularity in various cultures of the globe (Negi, Mishra, & Lakhera, 2018). The term "junk food" has been conceptualized as highly processed, nutrient-poor foods characterized heavy in harmful fats and refined carbohydrates (Kampouri, Kotopoulea-Nikolaidi, Daskou, & Giannopoulou, 2019). Junk food eating on a regular basis has been related to obesity, cardiovascular disease and metabolic disorders and other health problems (Amgain & Neupane, 2019; Kontele & Vassilakou, 2021). In particular, studies have shown that

nutrition may affect menstrual health with certain dietary habits escalating premenstrual symptoms, irregular menstrual cycles and dysmenorrhea (Kontele & Vassilakou, 2021).

The prevalence of junk food consumption among young adults has been a subject of growing concerns and has been extensively studied by researches. For example, Lillico, Hammond, Manske, and Murnaghan (2014) demonstrated that approximately 75% of early adults aged 18-25 reported consuming junk food at least once a week. Olatona, Onabanjo, Ugbaja, Nnoaham, and Adelekan (2018) has revealed that almost 40% of young adults aged 19-24 consumed junk food three or more times per week. Moreover, a study by Salvy, de la Haye, Bowker, and Hermans (2012) reported that 60% of early adults consumed junk food during their leisure activities while socializing with friends. In addition, another study conducted by Larson, Neumark-Sztainer, Laska, and Story (2011) was found that 90% of early adults reported eating junk food at least once a week in their sample. Similarly, NA, Al-Tamimi, Al-Jobair, and Al-Shwaiyat (2015) found a longitudinal increased in junk food consumption among early adults which was 50% at the age of 18 and 70% at the age of 24. These studies collectively highlight higher level of prevalence of junk food consumption among young adults and underscore the need for targeted interventions to promote healthier dietary habits in this area of population.

On the other hand, menstruation related-problems among early adults' women has been a subject of growing concerns. Several studies have shed light on the prevalence of these issues related to menstruation in this age group. For example, Kural, Noor, Pandit, Joshi, and Patil (2015) demonstrated that approximately 40% of early adult women experienced dysmenorrhea, commonly known as painful menstrual cramps. Ghandour et al. (2023) has revealed that 41% of early adult women reported irregular menstrual cycles. In addition, a study conducted by Vichnin, Freeman, Lin, Hillman, and Bui (2006) reported that 31% of early adult women experienced premenstrual symptoms such as mood swings and bloating. Similarly, another study conducted by the Davies and Kadir (2017) was found that 20% of early adult women reported heavy menstrual bleeding. Moreover, Fernández-Martínez (2021) investigated the prevalence of menstrual -related headaches among early adults' women and found that 45% of females experienced migraines during menstruation. These findings collectively highlight the various menstruation problems that early adult women may face, underscoring the importance of understanding and addressing these issues to promote better menstrual health in this population.

The consequences of junk food intake and menstrual health was important since both have a significant influence on young women's quality of life (Latif, Naz, Ashraf, & Jafri, 2022). Menstrual irregularities and unhealthy eating habits may have an impact on overall health, academic and athletic performance and general well-being of female athletes and non-athletes. This can also cause long-term health concerns (Hashim et al., 2019; Huhmann, 2020).

In the university setting, athletes and non-athletes exhibit distinct characteristics across various factors. Athlete might face challenges in balancing their training schedules and academics, compared to non-athletes (Rothschild-Checroune, Gravelle, Dawson, & Karlis, 2012). In terms of physical health, athletes generally demonstrated better indicators such as cardiovascular fitness and body composition due to regular sports participation (A. B. Loucks, 2004). However, despite potential stress related to sports performance, athletes tend to report higher level of self-esteem and overall psychological well-being compared to non-athletes (Nwankwo, Okechi, & Nweke, 2015). These findings likely to suggest that varsity students-athletes hold significantly distinct characteristics with respect to varsity non-athletic populations. These distinct characteristics among both type of varsity students

may further result in difference in mensural related variables and eating style particularly junk food consumption.

In recent years, regular exercise and physical activity have become effective treatment options for issues related to junk food intake and menstrual health (Amgain & Neupane, 2019). Regular exercise enhance hormonal balance, lessen the harmful effects of junk food on the body and lessen menstruation pain and abnormalities (Verma, Bansal, & Jain, 2020). Research found that those who were physically active particularly athletes have more regular menstrual cycles and less premenstrual symptoms than those people who lead sedentary lifestyles (Huhmann, 2020).

There was still a study deficit in the particular context of female athletes and non-athletes, despite the expanding corpus of literature addressing many elements of food, activity and menstrual health. This research may fill this gap by examining the differences in junk food intake, physical activity levels and menstruation. Therefore, the study aimed to compare the junk food consumption and menstrual health among female athletes verses non-athletes. We hypothized that female varsity athletes and female varsity non-athletes may differ with respect to mensural health and junk food consumption. Because both varsity student-athletes and students non-athletes suggested to be characterized certain distinct characteristics and encounter distinct challenges during their student life in the university (Rothschild-Checroune et al., 2012), (A. B. Loucks, 2004), (Nwankwo et al., 2015).

## Literature Review

### Menstrual health among athletes verses non-athletes

Rickenlund (2004) conducted a comparative study between the athletes and non-athletes regarding their menstrual health and demonstrated that athletes were at higher risk for irregularities in menstruation due to intense training, whereas non-athlete's menstrual health was more affected by lifestyle factors and underlying health conditions. In addition, monuntjoy (2014) described that female athlete intense training and low energy availability caused menstrual dysfunction in athletes. Similarly, M. De souza, J et al (2010) highlighted that diet and lack of exercise caused menstrual irregularities in non-athletes. Additionally, Fekr, Zadeh, Moghadam, and Salehian (2012) found no significant difference in menstrual health of female athletes and non-athletes. Moreover, a study by Mahvash et al. (2012) found that regular exercise had a positive impact on Dysmenorrhea symptoms, decreased rate of bleeding and reduced menstruation pain both in athletes and non-athletes. Similarly, a study conducted by A. B. Loucks, & Thuma, J. R. (2003) emphasized the pivotal role of energy availability in regulating menstrual cycle. Athletes with different energy requirements exhibited more stable menstrual cycle due to consistent energy balance as compared to non-athletes. Moreover, Vani, K, L, Kumar, and A (2013) found more prevalence of irregular menstrual cycle in non-athletes (85%) as compared to the athletes (57%) female students.

### Junk food consumption in athletes and non-athletes

A study conducted by Cherian, Gavaravarapu, Sainoji, and Yagnambhatt (2020) indicated that a considerable percentage of athletes consumed more fast food regularly than non-athlete. A cross-sectional study conducted by Sedek and Yih (2014) found that the prevalence of regular junk food consumption was lower among athletes than non-athletes. Similarly, Smit (2019) observed that female athletes exhibited a reduced intake of sugary snacks and fast food as compared to their non-athletes counterparts. In addition, French, Perry, Leon, and Fulkerson (1994) found that fast food and sugary snacks were the

most common types of junk food that consumed by both athletes and non-athletes. Moreover, Thomas, Burke, and Erdman (2016) in his study highlighted the effects of junk food in both athlete and non-athlete that lead to overeating and weight gain. Similarly, a study conducted by M. J. De souza, & Williams, N I. (2005) exhibited that athletes were engaged in strenuous activity which placed on immense muscle groups so, they eat two to three times more protein as compared to non-athletes. Another study conducted by White (2019) revealed that athletes consumed more junk food than non-athletes due to differences in their lifestyle and activity levels. A research by Maleki (2018) revealed that a substantial number of university athletes had poor eating habits, including of fast food and sugary snacks as compared to their counterparts.

**Effect of physical activity on human health**

Ahrens et al. (2014) proven in their research how regular exercise promotes hormonal balance and lowers inflammation, especially in female athletes. Botteri, Berstad, Sandin, and Weiderpass (2021) emphasized the positive impact of exercise on insulin and glucose regulation. Physical activity helped to prevent from type 2 diabetes. A meta-analysis by Shimul, Cheah, and Lou (2021) demonstrated that regular exercise, in combination with dietary changes was effective in preventing and treating obesity and menstrual health. Moreover, warburton (2006) exhibited that regular physical activity contributes to healthier cardiovascular system by improving heart function, reduced risk of heart diseases and lowered blood pressure and cholesterol. In addition, Leica (2006) found that engaging in regular physical activity, especially moderate aerobic exercise helped to alleviate menstrual cramps and discomfort.

**Material and Methods**

**Research Design**

The study design was cross-sectional.

**Population and sample**

In the current study, female students aged between 18-25. The data was collected through random sampling technique. Three hundred and forty (340) female athletes (170) and non-athletes (170) undergraduate students from 27 different departments of five different universities in Lahore, were the participants of this study. The inclusion criteria were, only female students should be part of the research. The exclusion criteria were, female students should be enrolled in Bs program and female athletes must be a part of university team. Age of the female students must be in between 18-25.

**Instruments**

The questionnaire was used for date collection, which included items related to demographic information and junk food consumption and menstrual abnormalities. Demographic information included Institute, age, semester, department, marital status, sports status, level of playing, years of participation, height, weight and BMI.

Junk food consumption and menstruation of athletes and non-athlete students were measured using a questionnaire that was developed by (Latif et al., 2022). This tool composed of 4 items of menstruation (pre-menstrual symptoms, irregular menstrual cycle, dysmenorrhea and menstrual abnormality in family history) and 9 items of junk food such as bakery items, refined grains, street food, sweet snacks, fast food, carbonated beverages, salty snacks, frozen meat and processed drinks.

**Procedure**

For date collection, questionnaire was given to the 340 participants to complete. Prior to start of data collection, the participants were briefed about the study purpose, instruction concerning procedure of questionnaire filling up. It was explained further to the participants that their participation would be voluntarily and their responses to the questionnaires would be kept confidential. Each participant has given 20-25 minutes to complete all the items of questionnaire. If any participant has question related to questionnaire, they were free to ask and were guided thoroughly so that they can complete their questionnaire. The permission was taken by the author of the questionnaire through email.

**Data Analysis**

SPSS version 22 was used for statistical analysis. The independent T-Test was used for data analysis. *P*-value was set at below 0.05 as significant.

**Results and Discussion**

The independent T-Test revealed the mean comparison of menstruation and junk food among female athletes and non-athletes in university setting.

The result revealed significant difference in menstruation of female athletes and non-athletes (see Table 1). Result revealed that irregular menstrual cycle exhibited significantly higher score in non-athlete students *(M= 1.68, SD= .469)* than athlete female students *(M= 1.91, SD= .469), t (338) = 5.408, p< .01.* To check the effect size, Cohen's d value was used. The Cohen's d value was *0.5(< 0.8)* which illustrated the medium effect size.

Result also revealed that premenstrual symptoms exhibited significantly higher score in female non-athletes *(M= 1.38, SD= .487)* than female athlete students *(M= 1.56, SD= .498), t (338) = 3.302, p< .05.* The Cohen's d value was *0.3(<0.5)* which demonstrated that effect size was small.

**Table 1**
**Mean Comparison of Athletes and Non-Athletes Menstruation**

| | Athlete | | Non-athlete | | | | |
|---|---|---|---|---|---|---|---|
| **Variables** | **M** | **SD** | **M** | **SD** | **t (338)** | **P** | **Cohen's d** |
| Irregular menstrual cycle | 1.91 | .293 | 1.68 | .469 | 5.408 | **.000** | 0.5 |
| Premenstrual symptoms | 1.56 | .498 | 1.38 | .487 | 3.302 | **.001** | 0.3 |

*Higher mean indicated better menstrual health and lesser problem in particular menstruation.

**Table 2**
**Mean Comparison of Athletes verses Non- Athletes on Junk Food Consumption**

| | Athlete | | Non-athlete | | | | |
|---|---|---|---|---|---|---|---|
| **Variables** | **M** | **SD** | **M** | **SD** | **t (338)** | **P** | **Cohen's d** |
| Consumption of refined grains | 2.18 | .641 | 1.97 | .580 | 3.195 | **.002** | 0.3 |
| Consumption of carbonated drinks | 1.87 | .811 | 1.65 | .786 | 2.512 | **.012** | 0.2 |

*Higher mean indicated higher level of consumption of particular variable and lower mean indicated lower level of consumption of particular variable.

The result indicated a significant difference in junk food consumption among athletes and non-athletes (see Table 2), which revealed that the consumption of refined grains and carbonated drinks was significantly higher in female athletes than non-athletes. Consumption of refined grains exhibited significantly higher score in athlete students *(M= 2.18, SD= .641)* than non- athlete female students *(M= 1.97, SD= .580), t (338) = 3.195, p< .05.* Cohen's d value was *0.3(< 0.5)* which demonstrated the small effect size.

In consumption of carbonated drinks athletes also have significantly higher score *(M= 1.87, SD= .811)* than female non-athlete students *(M= 1.56, SD= .786), t (338) = 2.512, p< .05.* The Cohen's d value was *0.2(<0.5)* that represented the small effect size.

**Discussion**

The findings of this research shed important light on the distinction between female athletes and non-athletes in a university context with regard to junk food intake and menstrual health. According to the findings, there was a substantial significant difference between two groups' athlete and non-athletes in the premenstrual symptoms, irregular menstrual cycle, intake of refined grains and consumption of carbonated beverages. The analysis yielded that menstrual health concerning pre-menstrual symptoms and irregularity in menstrual cycle was significantly better among female varsity student athletes than those with non-student varsity athletes. Surprisingly, intake of refined grains and carbonated beverages was significantly higher in female varsity students' athletes in comparison with female non-student athletes.

In term of menstrual health, female students who were not athletes exhibited significantly higher score for irregular menstrual cycle and premenstrual symptoms as compared to athlete female students. According to this result, women's menstrual regularity has been positively impacted by an athletic lifestyle and frequent exercise. This result was consistent with earlier study indicated the exercise's positive impact on hormone homeostasis (Chen, Imai, & Zhou, 2023). In line with our findings, another study demonstrated that exercise stimulates the release of endorphins and promote the production of estrogen considered important for maintaining regular menstrual cycle and exercise also lowers body fat percentage that suggested to be associated with irregular menstruation (Omidvar, 2019). Exercise has been shown to have positive impact on mood and help to improve pre-menstrual symptoms and irregular menstrual cycle (sharma, 2017). The result, therefore likely to suggest that there is possibility that exercise might hold benefits for regulation of menstrual health.

In term of junk food consumption, the findings showed that female athletes had a significantly higher consumption of refined grains and carbonated drinks compared to non-athlete female students. This findings was consistent with other research that highlighted how athletes often consumed more processed meals and sugary drinks (Momma et al., 2022). Junk food were typically higher in calories and Female athletes have higher energy demands due to their training regimens which could lead to increased hunger and cravings (Bragg, Roberto, Harris, Brownell, & Elbel, 2018). In order to encourage better food choices and balanced nutrition among female athletes in a university context, there should be special focus on nutritional education and awareness among female student athletes in the university. Interventions to improve dietary habits of female should be put into place.

Overall finding suggested that athletic status in a university setting had a positive influence on menstrual health outcomes include regularity and pre-menstrual symptoms. The increased use of refined carbohydrates and carbonated beverages among female athletes must be addressed. However, since these dietary decisions might have an impact on their long-term health.

This research has some limitations. Since, it was conducted in a particular academic environment and was not generalized to other population or context including professional female athletes. In order to advance further evidence, future studies should take into account with greater sample size in the academic settings.

**Implications**

The results of this research have important ramifications for the creation of health promotion initiatives at public universities. Women who were not athletes could enhance their menstrual regularity and lessen premenstrual symptoms by using tailored programmes that promote regular physical exercise. These efforts could include fitness courses, sports clubs and easily accessible recreational areas that were tailored to the particular requirements and interests of non-athlete students.

*Nutritional Education*: It was crucial to include nutritional education programmes in university settings due to the greater intake of refined grains and fizzy beverages among female athletes. Female athletes could make wise dietary decisions by working with university dining services to promote better food alternatives and by providing instructional courses on balanced and nutritious diets. These programmes also help athletes to experience greater menstrual health and general wellbeing.

*Menstrual Health Awareness*: The study results might also be used to help female students at public institutions become more aware of menstrual health issues. To reduce stigma associated with menstruation-related issues, educational campaigns and seminars could be held. Giving female students knowledge about the possible effects of exercise and nutritional choices on menstrual health also helped them to make educated decisions and if necessary, seek out the right assistance.

*Additional Research*: The study provides a foundation for future investigations into menstrual health of female athletes and non-athletes. Future research could examine how other lifestyle elements such as stress levels, sleep habits and hormonal contraceptive usage affect issues associated to menstruation. The generalizability of the results and the depth of the knowledge of the subject, both be improved by looking at a bigger and more varied sample encompassing many institutions.

*Policy Development*: The results of this research must help the public institutions to build policies and recommendations to promote the menstrual health of female students. In order to ensure that students have access to the right materials, support services and facilities, universities could include menstrual health into their health and wellness policy. Additionally, regulations could also be set up to encourage more healthy food alternatives on campus and increasing the accessibility of wholesome options for all students.

Planning interventions, educational initiatives and legislative measures aimed for enhancing menstruation health among female athletes and non-athletes at public institutions must take into account. Universities could support their students' general wellbeing and academic achievement by addressing the unique demands and difficulties experienced by these communities.

In conclusion, this study highlighted the differences in menstrual health and junk food consumption between female athlete students and non-athletes in the university setting. The findings supported the potential benefit of athletic life style in promoting menstrual regularity and managing pre-menstrual symptoms. However, attention should be given to the dietary choices of female athletes to ensure optimal nutrition and overall health. These findings contribute to the existed literature and provide insights to develop targeted interventions and educational programs to enhance the well-being of female university students.

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