Biological and Clinical Sciences Research Journal
eISSN: 2708-2261; pISSN: 2958-4728
www.bcsrj.com
DOI: https://doi.org/10.54112/bcsrj.v2024i1.1119
*Biol. Clin. Sci. Res. J., Volume, **2024**: 1119*
Original Research Article

COMPARISON OF POLYCYSTIC OVARIAN SYNDROME WITH JUNK FOOD CONSUMPTION IN WOMEN OF REPRODUCTIVE AGE IN DISTRICT SIALKOT, PAKISTAN

SEHAR K[1], ASHRAF S[*1], RASHEED I[1], ABBAS A[2], ABBAS Z[2], KHAN MR[2], ASLAM S[2]

[1]*Department of Zoology University of Sialkot, Pakistan, Pakistan*
[2]*Department of Zoology University of Narowal, Pakistan, Pakistan*
**Corresponding author`s email address:* saima.ashraf@uskt.edu.pk

(Received, 04th June 2024, Revised 05th September 2024, Published 17th September 2024)

Abstract: *Polycystic Ovary Syndrome (PCOS) is a prevalent endocrine disorder affecting women of reproductive age, often associated with metabolic and reproductive complications. Junk food consumption has been linked to worsening PCOS symptoms. Limited data from Pakistan exists on this correlation. A study in District Sialkot aims to explore this association.* ***Objective:*** *To explore the correlation between junk food consumption and the prevalence and severity of PCOS symptoms among women of reproductive age in District Sialkot, Pakistan.* ***Methods:*** *This cross-sectional study was conducted at Allama Iqbal Memorial Hospital, Sialkot, from April to May 2024. A total of 80 women aged 18-45 were enrolled, including 40 women diagnosed with PCOS and 40 women without PCOS (control group). Data were collected using a structured questionnaire covering demographic details, medical history, dietary habits, and PCOS-related symptoms. Statistical analysis was performed using chi-square tests and t-tests, with a significance level of $p < 0.05$.* ***Results:*** *The prevalence of regular junk food consumption was significantly higher in the PCOS group (65%) compared to the control group (5%) ($p < 0.001$). Women with PCOS who consumed junk food frequently exhibited more severe symptoms, including irregular menstrual cycles (85.7%), hormonal imbalance (78.6%), acne (75%), and hirsutism (67.9%), compared to non-junk food consumers ($p < 0.001$). Obesity was also more prevalent among the PCOS group (50%) than the control group (30%), though the association between BMI and PCOS was not statistically significant ($p = 0.11$).* ***Conclusion:*** *This study establishes a significant correlation between junk food consumption and the severity of PCOS symptoms among women in District Sialkot. The findings highlight the need for dietary interventions to mitigate the health burden of PCOS. Further research should explore the role of comprehensive lifestyle modifications, including diet and physical activity, in managing PCOS.*

Keywords: junk food consumption, reproductive health, insulin resistance, Sialkot, Pakistan

Introduction

Polycystic Ovary Syndrome (PCOS) is one of the most prevalent endocrine disorders affecting women of reproductive age, with an estimated global prevalence of 8–13%, depending on the population and diagnostic criteria used (Deswal et al., 2020) (Deswal, Narwal, Dang, & Pundir, 2020). Characterized by hyperandrogenism, ovulatory dysfunction, and polycystic ovaries, PCOS is associated with a wide array of complications, including metabolic disturbances, cardiovascular disease, infertility, and psychological distress (Teede et al., 2018) (Teede et al., 2018). These symptoms not only diminish the quality of life for affected individuals but also pose significant challenges to healthcare systems worldwide, particularly in low-resource settings such as Pakistan.

Dietary patterns, particularly the consumption of energy-dense, nutrient-poor foods, have increasingly been implicated in the pathogenesis and severity of PCOS (Barrea et al., 2019) (Barrea et al., 2019). Junk food, characterized by high refined sugars, unhealthy fats, and preservatives, is widely consumed due to its affordability and convenience. Research suggests that such dietary habits may exacerbate insulin resistance, a core feature of PCOS, thereby worsening the clinical presentation of the syndrome (García-Hernández et al., 2021) (Torres, 2022). Insulin resistance can increase the production of androgens, thereby aggravating hyperandrogenic symptoms such as hirsutism, acne, and anovulation (Liu et al., 2021) (Liu et al., 2021).

In Pakistan, where urbanization and lifestyle shifts are accelerating, junk food consumption is rising, especially among young adults and reproductive-aged women (Yahya et al., 2022) (Junaid et al., 2022). This raises concerns about the potential link between dietary choices and the increasing burden of PCOS in the region. Sialkot, a rapidly developing district, reflects this trend, with women frequently consuming processed foods due to time constraints and economic factors.

Despite a growing body of evidence linking poor dietary habits with PCOS, there is a scarcity of region-specific data examining this relationship in Pakistan. This study aims to explore the correlation between junk food consumption and the prevalence of PCOS among women of reproductive age in Sialkot. By identifying the dietary factors that may influence PCOS symptomatology, this research hopes to contribute to the development of targeted nutritional interventions that can mitigate the health burden of PCOS in the Pakistani population.

[Citation Sehar, K., Ashraf, S., Rasheed, I., Abbas, A., Abbas, Z., Khan, Mr., Aslam, S. (2024). Comparison of polycystic ovarian syndrome with junk food consumption in women of reproductive age in district Sialkot, Pakistan. *Biol. Clin. Sci. Res. J.*, **2024***: 1119*. doi: https://doi.org/10.54112/bcsrj.v2024i1.1119]

Methodology

This research employed a cross-sectional survey design to investigate the correlation between Polycystic Ovary Syndrome (PCOS) and junk food consumption among reproductive-aged women. The study was conducted at Allama Iqbal Memorial Hospital, Sialkot, Pakistan, between April 2024 and May 2024. The primary aim was to assess dietary habits and their potential link to the prevalence and severity of PCOS symptoms. The study was designed to provide descriptive and inferential insights into the relationship between junk food consumption and PCOS.

The study targeted women of reproductive age (18–45 years) diagnosed with PCOS and receiving treatment at Allama Iqbal Memorial Hospital. A total of 80 women participated, divided equally into two groups: 40 women diagnosed with PCOS and 40 women serving as a control group without PCOS. Participants were selected through random sampling to ensure that the sample was representative of the larger population in the district.

A structured questionnaire was used for data collection. The questionnaire was designed based on existing literature and included several sections:

Age, marital status, education, and socioeconomic status.

Health and Medical History: Diagnosis and duration of PCOS, other reproductive health issues, family history of diabetes, and previous fertility treatments.

Dietary Habits: Frequency and type of junk food consumed (e.g., fast food, sweets, processed snacks).

Menstrual cycle regularity, pregnancy history, and contraceptive use.

PCOS Symptoms: Obesity, acne, hirsutism, irregular menstrual cycles, hormonal imbalances, and weight gain.

The questionnaire was administered via face-to-face interviews conducted by trained healthcare professionals to ensure accuracy and clarity in responses. Both open-ended and closed-ended questions were used to gather a comprehensive dataset.

The primary variables examined in this study included:

Junk food consumption (categorized based on frequency: rarely, occasionally, frequently, and consistently).

Dependent Variables: PCOS symptoms (irregular menstrual cycles, hormonal imbalances, obesity, dyslipidemia, acne, hirsutism).

Inclusion and Exclusion Criteria

Women aged 18–45 diagnosed with PCOS and receiving treatment at Allama Iqbal Memorial Hospital. Control group participants were women of the same age range without a PCOS diagnosis.

Women with any significant medical condition that could interfere with the study, those who were pregnant, or those who could not provide informed consent.

The collected data were recorded in Microsoft Excel and analyzed using Minitab 20. The following statistical tests were used: Descriptive statistics (mean, standard deviation, and frequency distribution) to summarize demographic and clinical characteristics and chi-square tests to evaluate the association between junk food consumption and PCOS symptoms. T-tests were employed to compare means between the PCOS and control groups regarding junk food consumption and its impact on clinical parameters such as BMI and hormone levels.

A p-value of less than 0.05 was considered statistically significant.

Informed consent was obtained from all participants before data collection. The study was approved by the Ethics Review Board of Allama Iqbal Memorial Hospital, and the confidentiality of participant information was strictly maintained throughout the research.

Results

Table 1 summarizes the demographic details of the participants. Most women were between 25 and 30 (41.25%), with a similar proportion across the PCOS and control groups. Marital status showed an equal distribution of single and married women in the PCOS group, while slightly more participants in the control group were single (55%). Regarding education, the majority had secondary or higher education, reflecting relatively good educational attainment among the participants.

Table 2 shows the relationship between junk food consumption and PCOS in the study participants. Out of 40 women in the PCOS group, 26 (65%) reported regular junk food consumption, while only 2 (5%) from the control group consumed junk food regularly. This difference is highly significant, with a p-value of **< 0.001**, suggesting a strong correlation between frequent junk food consumption and the presence of PCOS. (Figure 1)

Table 3 highlights the BMI distribution among participants. Half of the women in the PCOS group (50%) were classified as obese (BMI ≥30), compared to 30% in the control group. The overweight category was similarly distributed between the two groups. Despite these differences, the association between BMI and PCOS was not statistically significant ($p = 0.11$), indicating that while obesity is more common in women with PCOS, it may not be a definitive predictor of the syndrome in this sample.

Table 4 examines the prevalence of PCOS-related symptoms, such as irregular menstrual cycles, hormonal imbalance, acne, and hirsutism, in junk food consumption. Women who consumed junk food were significantly more likely to exhibit these symptoms. For instance, 85.7% of women who regularly consumed junk food reported irregular menstrual cycles compared to 30.7% of non-junk food consumers. The p-values for all the symptoms were **< 0.001**, indicating a significant association between junk food consumption and the severity of PCOS symptoms.

Table 1: Demographic Information of Study Participants (n = 80)

Demographic Variable	PCOS Group (n=40)	Control Group (n=40)	Total (n=80)
Age (years)			
18–24	12 (30%)	10 (25%)	22 (27.5%)
25–30	15 (37.5%)	18 (45%)	33 (41.3%)
31–35	8 (20%)	6 (15%)	14 (17.5%)
36–45	5 (12.5%)	6 (15%)	11 (13.5%)
Marital status			
Single	20 (50%)	22 (55%)	42 (52.5%)
Married	20 (50%)	18 (45%)	38 (47.5%)
Education			
Below Secondary	5 (12.5%)	7 (17.5%)	12 (15%)
Secondary	20 (50%)	16 (40%)	36 (45%)
Higher Education	15 (37.5%)	17 (42.5%)	32 (40%)

[Citation Sehar, K., Ashraf, S., Rasheed, I., Abbas, A., Abbas, Z., Khan, Mr., Aslam, S. (2024). Comparison of polycystic ovarian syndrome with junk food consumption in women of reproductive age in district Sialkot, Pakistan. *Biol. Clin. Sci. Res. J.*, **2024***: 1119*. doi: https://doi.org/10.54112/bcsrj.v2024i1.1119]

Table 2: Junk Food Consumption in PCOS and Control Groups (n = 80)

Consumption Frequency	PCOS Group (n=40)	Control Group (n=40)	Total (n=80)	p-value
Yes	26 (65%)	2 (5%)	28 (35%)	< 0.001
No	14 (35%)	38 (95%)	52 (65%)	

Table 3: Body Mass Index (BMI) Distribution in PCOS and Control Groups (n = 80)

BMI Category	PCOS Group (n=40)	Control Group (n=40)	Total (n=80)	p-value
Average Weight (18.5-24.9)	6 (15%)	12 (30%)	18 (22.5%)	
Overweight (25-29.9)	14 (35%)	16 (40%)	30 (37.5%)	0.11
Obesity (≥30)	20 (50%)	12 (30%)	32 (40%)	

Table 4: Association Between Junk Food Consumption and PCOS-Related Symptoms (n = 80)

Symptom	Junk Food Consumers (n=28)	Non-Junk Food Consumers (n=52)	p-value
Irregular Menstrual Cycle	24 (85.7%)	16 (30.7%)	< 0.001
Hormonal Imbalance	22 (78.6%)	14 (26.9%)	< 0.001
Acne	21 (75%)	15 (28.8%)	< 0.001
Hirsutism	19 (67.9%)	13 (25%)	< 0.001

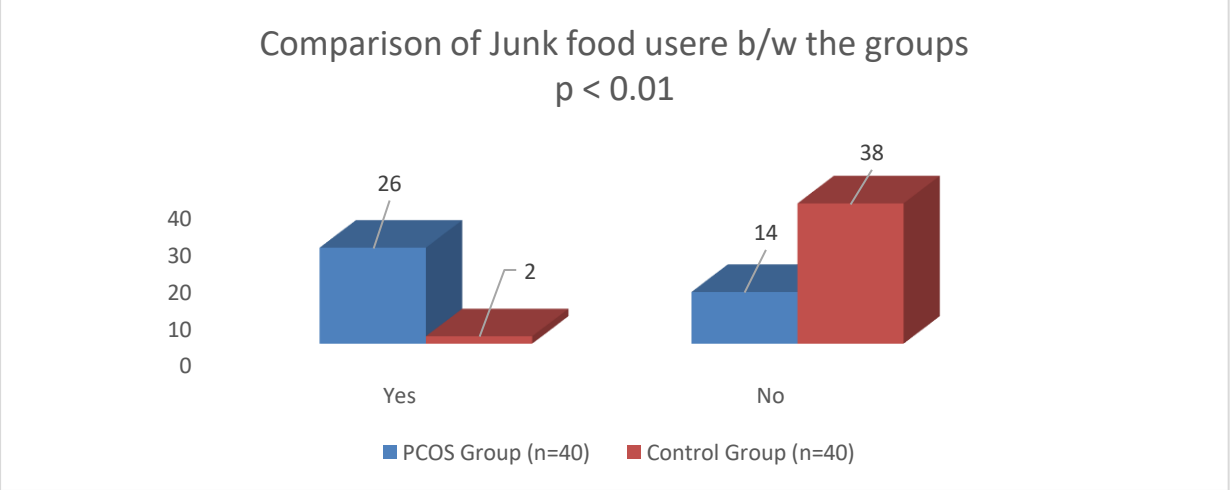

Figure 1 Comparison of Junk Food Users B/W groups

Discussion

The findings of this study provide strong evidence of the correlation between junk food consumption and the prevalence of Polycystic Ovary Syndrome (PCOS) among women of reproductive age in District Sialkot, Pakistan. The results show that 65% of women in the PCOS group regularly consumed junk food, compared to only 5% in the control group ($p < 0.001$). Furthermore, junk food consumers in the PCOS group were significantly more likely to exhibit symptoms such as irregular menstrual cycles, hormonal imbalance, acne, and hirsutism ($p < 0.001$). These results highlight the potential impact of dietary habits on the development and severity of PCOS, consistent with findings from previous studies.

The relationship between diet and PCOS has been a topic of increasing research interest. Junk food, characterized by high levels of refined carbohydrates, unhealthy fats, and sugars, contributes to insulin resistance—a key feature in the pathophysiology of PCOS. Insulin resistance exacerbates hyperandrogenism, leading to the worsening of symptoms such as irregular menstruation, hirsutism, and acne (Teede et al., 2018) (Teede et al., 2018). In line with these findings, our study showed a significant association between frequent junk food consumption and more severe PCOS-related symptoms.

Recent studies have also explored the role of diet in managing PCOS symptoms. A study by Barrera et al. (2020) (Barrea et al., 2019). Highlighted the benefits of a balanced diet rich in whole grains, fruits, and vegetables while identifying poor dietary habits as a risk factor for metabolic disturbances in PCOS. Similarly, García-Hernández et al. (2021) (García-Hernández, Ruiz-Doblado, Rodriguez-Pichardo, & Camacho, 1999). Demonstrated that diets high in processed foods and sugars can aggravate insulin resistance, making PCOS more challenging to manage. Our results align with these findings, further reinforcing the role of poor dietary habits, particularly junk food consumption, in the progression of PCOS.

The high prevalence of obesity among women with PCOS in our study (50% vs. 30% in the control group) further supports the existing literature on the link between obesity, junk food consumption, and PCOS. A meta-analysis by Lim et al. (2019) (Lim et al., 2012). found that overweight and

[Citation Sehar, K., Ashraf, S., Rasheed, I., Abbas, A., Abbas, Z., Khan, Mr., Aslam, S. (2024). Comparison of polycystic ovarian syndrome with junk food consumption in women of reproductive age in district Sialkot, Pakistan. *Biol. Clin. Sci. Res. J.*, **2024***: 1119*. doi: https://doi.org/10.54112/bcsrj.v2024i1.1119]

obese women with PCOS often experience more severe symptoms and have a higher risk of developing long-term metabolic complications. Although the BMI results in our study were not statistically significant ($p = 0.11$), the trend aligns with previous research, indicating that obesity is a significant contributing factor in the severity of PCOS symptoms.

The strong association between junk food consumption and PCOS underscores the importance of dietary interventions in the management and prevention of PCOS. Nutritional counseling should be incorporated into the clinical care of women with PCOS, focusing on the reduction of processed foods and the promotion of healthier eating habits. Public health campaigns in Pakistan, especially in regions like Sialkot, where junk food consumption is on the rise, should target the underlying lifestyle factors that exacerbate PCOS and other metabolic conditions.

While this study provides valuable insights into the correlation between junk food consumption and PCOS, some limitations should be addressed. The sample size was relatively small, and the study was conducted in a single district, which may limit the generalizability of the findings to other populations. Future research should consider more extensive, multi-centered studies to validate these results and explore additional factors, such as physical activity and stress levels, which were not assessed in this study but are known to influence PCOS.

Conclusion

This study adds to the growing body of evidence linking poor dietary habits, specifically junk food consumption, to the development and exacerbation of PCOS symptoms. The strong correlation between junk food consumption and PCOS-related symptoms such as irregular menstrual cycles, hormonal imbalance, and acne highlights the need for dietary interventions as part of a comprehensive approach to managing PCOS. Future research should further explore the role of lifestyle modifications, including diet and exercise, in reducing the burden of PCOS in women of reproductive age.

Declarations

Data Availability statement

All data generated or analyzed during the study are included in the manuscript.

Ethics approval and consent to participate

Approved by the department concerned. (IRBEC-NUSIK-23/22)

Consent for publication

Approved

Funding

Not applicable

Conflict of interest

The authors declared the absence of a conflict of interest.

Author Contribution

KANWAL SEHAR
Coordination of collaborative efforts.
Study Design, Review of Literature.
SAIMA ASHRAF
Conception of Study, Development of Research Methodology Design, Study Design, manuscript Review,
IQRA RASHEED
Manuscript revisions, critical input.
Coordination of collaborative efforts.
ALI ABBAS
Data acquisition and analysis.
Manuscript drafting.
ZUHA ABBAS
Data entry and data analysis, as well as drafting the article.
MARYAM RAUF KHAN
Data acquisition and analysis.
Coordination of collaborative efforts.
SANA ASLAM
Manuscript revisions, critical input.
Coordination of collaborative efforts.

References

1 Barrea, L., Arnone, A., Annunziata, G., Muscogiuri, G., Laudisio, D., Salzano, C., . . . Savastano, S. (2019). Adherence to the Mediterranean diet, dietary patterns, and body composition in women with polycystic ovary syndrome (PCOS). *Nutrients, 11*(10), 2278.

2 Deswal, R., Narwal, V., Dang, A., & Pundir, C. S. (2020). The prevalence of polycystic ovary syndrome: a brief systematic review. *Journal of Human Reproductive Sciences, 13*(4), 261-271.

3 García-Hernández, M. J., Ruiz-Doblado, S., Rodriguez-Pichardo, A., & Camacho, F. (1999). Alopecia areata, stress, and psychiatric disorders: a review. *The Journal of dermatology, 26*(10), 625-632.

4 Junaid, M., Khan, M. A., Al-Muhimeed, T. I., AlObaid, A. A., Nazir, G., Alshahrani, T., . . . Akhtar, M. N. (2022). Structural, spectral, dielectric, and magnetic properties of indium substituted Cu0. 5Zn0. 5Fe2− x O4 magnetic oxides. *Journal of Materials Science: Materials in Electronics, 33*(1), 27-41.

5 Lim, S. S., Davies, M., Norman, R. J., & Moran, L. (2012). Overweight, obesity and central obesity in women with polycystic ovary syndrome: a systematic review and meta-analysis. *Human reproduction update, 18*(6), 618-637.

6 Liu, J., Yang, W., Liu, Y., Lu, C., Ruan, L., Zhao, C., . . . Lv, W. (2021). Combination of Hua Shi Bai Du granule (Q-14) and standard care in the treatment of patients with coronavirus disease 2019 (COVID-19): a single-center, open-label, randomized controlled trial. *Phytomedicine, 91*, 153671.

[Citation Sehar, K., Ashraf, S., Rasheed, I., Abbas, A., Abbas, Z., Khan, Mr., Aslam, S. (2024). Comparison of polycystic ovarian syndrome with junk food consumption in women of reproductive age in district Sialkot, Pakistan. *Biol. Clin. Sci. Res. J.*, **2024***: 1119*. doi: https://doi.org/10.54112/bcsrj.v2024i1.1119]

7 Teede, H. J., Misso, M. L., Costello, M. F., Dokras, A., Laven, J., Moran, L., . . . Norman, R. J. (2018). Recommendations from the international evidence-based guideline for the assessment and management of polycystic ovary syndrome. *Human reproduction, 33*(9), 1602-1618.

8 Torres, R. M. (2022). Estrategias sostenibles e innovación científica.