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Associations between the Consumption of Junk Food and Ovarian Cysts in Young Adult Girls in Islamabad

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ABSTRACT

Food Intake and Prevalence of Ovarian Cyst among Young Adult Girls of Islamabad: A Cross-Sectional Study Eating too much junk food, which contains high amounts of Tran's fat, sugars, and processed substances, is commonly linked to the development of ovarian cysts. To study junk food intake, food consumption & cyst prevalence, in particular among women with Polycystic Ovary Syndrome (PCOS).A stratified random sampling was utilized in recruiting 400 participants from schools and hospitals to conduct this cross-sectional study with a sample size. Data on dietary habits, medical history, and lifestyle factors was collected using 3 structured questionnaires. Clinical evaluations were conducted, and ultrasounds were utilized to confirm the presence of cysts on the ovaries when possible. Associations between dietary patterns and reproductive health were detected using statistical analyses. Analysis revealed a strong relationship between what the researchers called a "high frequency of junk food consumption" and the incidence of ovarian cysts. Those taking a large quantity of fast food, soda, sweetened beverages and processed snacks had higher chances of developing ovarian cysts, particularly those diagnosed with PCOS. Article focusing on the research emphasizes the multidisciplinary approach used to arrive at these findings and its implications for public health through the development of nutrition promotion strategies targeted towards all women of reproductive age. This association should be addressed in future studies to understand whether the reported differences in dietary patterns are related to the proposed common mechanistic pathways linking ovarian health and infertility. By utilizing

longitudinal data as well as biochemical measurements. Eating patterns to reproductive health and supports public health measures promoting nutritional awareness and life style changes in young women. The future scope of research should be focused on determining the mechanisms that underpin the association between dietary habits and ovarian health fast food, soda, or sweetened beverages and processed snack had an increased risk of ovarian cysts, especially for patients with PCOS, This paper highlights the importance of was considerably correlated with junk food consumption in high frequency. “Compared with the lower consumption group, participants with higher consumption of It was found that the predominance of ovarian cysts.

Keywords Ovarian cysts, Junk food, PCOS, Dietary habits, Reproductive health, Young women, Islamabad.

INTRODUCTION

Ovarian cysts are one of the most common conditions seen in young females, and reproductive health issues associated with this has been rising in recent years. Ovarian cysts are fluid-filled sacs that form in or on the surface of an ovary and are generally harmless. However, they occasionally result in complications, including menstrual dysfunction, pelvic pain, infertility, and hormonal imbalances. Ovarian cysts are common in women suffering Polycystic Ovary Syndrome (PCOS) a disorder caused by unhealthy dietary habits and poor lifestyle choices. PCOS is a common reproductive disorder usually associated with obesity, insulin resistance, and metabolic syndrome. The close relation between metabolic disorders and hormonal imbalance demonstrates the need to investigate the effects of diet on ovarian health.

In the last couple of years, there has been a rapid shift in global dietary trends, most notably in developing nations such as Pakistan. It can also be reflected in the easy availability of fast food and processed snacks and their affordability which encourages increased consumption especially among younger people. Junk food products are rich in trans-fat, refined sugar and synthetic additives and have low nutritional value, which made them associated with several health issues like obesity, diabetes and reproductive problems. Junk food is increasingly popular and its impact on the ovaries needs to be studied (Saba, Fatima, Farooq, & Zafar, 2021; Saba, Tabish, & Khan, 2017).

Significance of the Study

Pakistan, like most other nations around the globe, is facing an upsurge in lifestyle diseases like obesity, diabetes and reproductive diseases. Young women, especially urban dwellers in cities like Islamabad and Rawalpindi, often eat excessive amounts of processed and fast food, owing to hectic lifestyles, marketing impact and social trends. However, there is a scarcity of studies examining the impact of these dietary changes on reproductive health, particularly in terms of ovarian cyst formation. If a strong association is proven between the consumption of junk food and the emergence of ovarian cysts, it will highlight the importance of public health education and preventive management. The current study was planned to determine the

relationship between junk food intake and development of ovarian cyst among young women of Islamabad and Rawalpindi to fill the above mentioned knowledge gap. With the results, healthcare professionals, policymakers and the general population can be informed of the role that a well-balanced diet may play in promoting reproductive health over the long term. Since finding dietary habits that contribute to ovarian dysfunction can also be proportionally important in preventing such conditions.

Ovarian Cysts and Polycystic Ovary Syndrome (PCOS)

Both physiological and pathological processes may lead to the development of ovarian cysts. Functional cysts, like follicular cysts and corpus luteum cysts, are the most common and usually only need to get out of their way. But other types of cysts — like desmoids cysts, endometriomas and cyst adenomas — can be treated with medication. This is one of the most common conditions that lead to the formation of ovarian cysts. PCOS is a hormonal imbalance affecting women of reproductive age and characterized by small cysts on the ovaries, irregular periods, high androgen levels and metabolic problems like insulin resistance. It's believed that a combination of genetic, environmental, and lifestyle factors play a role in the development of PCOS, though researchers do not fully understand the condition's exact cause. Of these, the diet has been highlighted as a major influencer. Insulin resistance will drive the ovaries to produce too many androgens further compounding ovarian dysfunction and a diet high in refined carbohydrates, unhealthy fats, and artificial additives can increase it. Research has revealed that overconsumption of junk foods can exacerbate PCOS symptoms and can also influence the severity and progression of the disease.

The part of junk food in hormonal imbalance

So-called junk food is calorie rich and nutrient poor. Such foods include fast food and fast food 店 such as hamburgers, French fries, fried chicken, pizza, processed snacks, soft drinks, sticky desserts, etc. They are top sources of harmful fats (such as trans and saturated fat), refined sugars, artificial additives and excessive sodium, all of which have detrimental effects on overall health. High intake of processed sugars and bad fats is closely related to metabolic disorders, obesity, diabetes, and cardiovascular diseases (Azhar, 2024; Azhar, et al., 2022). These dietary factors promote insulin resistance, leading to an overproduction of insulin by the pancreas. Analysis of women with PCOS shows that this imbalance of insulin increases androgen production in the ovaries, preventing normal ovulation and leading to the formation of cysts. Junk food consumption is also tied to chronic inflammation, another significant contributor to ovarian dysfunction. Most processed foods are loaded with pro-inflammatory substances that lead to oxidative stress and hormonal imbalance. Continued inflammation has been associated with a range of reproductive health issues, including menstrual irregularities, infertility and ovarian cyst formation.

Young Women's Lifestyle Changes: Trends

In the past few decades, Pakistan has experienced rapid urbanization and globalization, which has greatly affected the dietary habits of the population and led to a departure from traditional home-cooked food to fast food and processed snacks.

This shift has been especially evident in metropolitan cities like Islamabad and Rawalpindi, where a growing population, particularly the younger generation (women as well as men), is adopting westernized dietary habits. Increasing consumption of junk foods along with physical inactivity is associated with an increased prevalence of obesity and metabolic disorders in females (Azhar, 2024; Azhar, et al., 2022). Time difficulties, cost, social forces, and the relentless marketing pressure of the fast-food industry (Ahmad, Sewani, & Ali, 2021). The reproductive health of young Pakistanis is severely compromised as the reasons discussed above contribute to high-calorie fast food intake. This kind of diet poses a risk of developing ovarian cysts and conditions such as PCOS. This also in turn worsens metabolic disorders and reproductive disorders due to bad diet and sedentary lifestyles. Explaining the relationship between junk food consumption and the developed of ovarian cyst is important for avoid such disease (Khan, Farooq, & Kamal, 2023). If such significant data are gathered, preventive measures should be established to recommend more health-promoting eating patterns, especially among adolescent girls. Increasing awareness about the effect of processed food on reproductive health can help curb the increasing prevalence of diabetes and other ovarian disorders while improving the overall well-being of women.

Rationale for the Study

Reproductive health has emerged as one of the most serious challenges faced by women today, with ovarian cysts and Polycystic Ovary Syndrome (PCOS) impacting the lives of millions of women globally. These disorders may also lead to complications such as menstrual irregularities, infertility, and metabolic imbalances. Diet is one of the factors that contribute to reproductive health, but the impact of diet on pregnancy remains understudied, especially in developing countries like Pakistan.

Dietary patterns have been substantially changed over the last decades with rapid urbanization, globalization, and lifestyle modifications (Thomas, Khan, & Ahmad, 2022). Home cooked food has been replaced with processed and fast foods loaded with unhealthy fats, refined sugar, and chemical additives. These dietary shifts have been associated with an increase in metabolic disorders, obesity and insulin resistance, all of which are intimately related to ovarian pathological opponent. Though genetic factors have been analyzed along with hormonal factors, whether dietary components, particularly junk food consumption, play a role in the development of ovarian cysts has yet to be determined.

The increase in the prevalence of PCOS and other ovarian ovarian disorders in Pakistan, along with other developing countries. However, there have been few studies to show the direct association between diet and ovarian health in the country. The present study aims to fill this gap by examining the impact of junk food consumption on ovarian cyst formation among young adult women living in Islamabad and Rawalpindi.

Investigation focused around this association, seeks empirical evidence to guide public health initiatives, dietary advice, and lifestyle changes. A powerful connection between junk food intake and cysts [] would highlight the importance of awareness programs, dietary education, and preventive healthcare approaches to

foster better eating behavior in females during their formative years. In conclusion, the results of the study could be a foundation for further research as well as a guide for health care professionals to address reproductive health issues more effectively.

Objectives of the Study:

This study was aimed at assessing the association between junk food consumption and ovarian cyst in female young adults of age group 15–35 years living in Islamabad and Rawalpindi.

The research aims to:

- Analyze dietary habits – Finding out how often and what types of junk food urban young women consume;
- Assess the prevalence of PCOS and ovarian cysts – Determine how common these conditions are in the study participants.
- Investigate the impact of junk food on ovarian cysts – Explore whether there is a statistically significant association between junk food consumption and ovarian health in a larger population cohort.
- Recognize risk factors – Review additional lifestyle contributors to the development of cysts, such as sedentary lifestyles and obesity.
- Offer advice on dietary or lifestyle changes – Recommend practices to support healthful reproductive function as well as prevent ovarian dysfunction.

This study will adapt the cross-sectional research design that collects data on dietary habits, health status, and lifestyle factors among young women. The findings will help better elucidate the role of junk food consumption on the development of ovarian cysts and other related health issues.

RESEARCH HYPOTHESIS

Hypothesis:

There could be an association or linkage between consumption of junk food and ovarian cyst formation. The research aims to study the relationship between food and the existence of ovarian cysts in young women.

Null Hypothesis (H₀):

Junk food only increases the risk of ovarian cysts by 0.0% this implies that fast food, processed snack foods and sugary drinks do not significantly contribute to the formation of ovarian cysts. If true, this would indicate that genetic, hormonal, and environmental influences are the primary drivers of ovarian cyst formation, and that fast remained relatively rare with the mentioned utility. It suggests that, in this situation, dietary interventions on their own may lack sufficient impact to reduce the prevalence of ovarian cysts, necessitating the evaluation of alternative medical and lifestyle considerations.

Alternative Hypothesis (H₁):

High consumption of junk food is linked to the occurrence of ovarian cysts. This theory suggests that excessive consumption of unhealthy, processed foods leads to developing ovarian cysts due to:

ul Haq (2017) influencing metabolic health – Junk food is usually rich in Tran's fats, made of refined sugars and processed carbohydrates, each of which can

contribute to weight gain, obesity, and metabolic syndrome. These conditions are also known risk factors for ovarian dysfunction and hormonal deregulation.

Increased body insulin resistance – Studies have demonstrated that high intake of processed foods can contribute to body insulin resistance, one of the leading causes of PCOS. Insulin resistance causes excess insulin to be produced, raising androgen levels and interfering with normal ovulation, resulting in cysts.

Disruption of hormone balance — since junk food is stuffed with additives, artificial preservatives and high glycaemic index, they can upset the endocrine system, which regulates levels of estrogen, progesterone and androgen. These interruptions can lead to menstrual irregularities and ovarian dysfunction.

If proven, it will indicate that our reproduction has a lot to do with what we eat. According to data up to October 2023, the findings would emphasize the need for programmatic interferences towards promoting austerity of eating habits or more elaborate eating behavior in young women which can lead a preventive approach towards mitigation of ovarian cystic development. It would also emphasize the importance of public health measures, such as awareness programs and dietary recommendations, to mitigate junk food intake and enhance reproductive health results.

What the study means you need to be aware of:

Public Health Awareness – If a solid correlation is established between junk food intake and ovarian cyst formation, public health initiatives can be implemented to raise awareness among young women about the dangers of poor eating patterns. 02/22/17 (edited and amended for accuracy): RMMI and others are still working to end the stigma surrounding mental health, with schools/universities and health care organizations playing an important role in spreading awareness.

Preventive Healthcare Approaches – The results may assist medical experts in creating preventive actions to limit the threats of ovarian cyst and paclitaxel leading medical syndrome through dietary recommendations and lifestyle changes. Gynecologists and endocrinologists might include nutritional info in a patient visit.

Using the research findings to recommend policy changes to regulate junk food marketing aimed primarily at young adults. **Policy Implications:** We can also consider educational initiatives such as nutritional labeling, restrictions on unhealthy food marketing (especially to vulnerable populations like children), and making healthier food options available in the workplace and schools.

Opportunity for Further Investigations – This investigation can provide a basis for future studies in reproductive health and nutrition Long-term studies could also be performed to determine the status of the long-term effects of diet on ovarian health and whether there are other variables involved in reproductive disorders.

Dietary habits strongly influence various health aspects, including hormonal balance and metabolic health, thus reproductive health – an important marker of a woman's overall well-being. Although genetic and hormonal factors have been extensively investigated for their roles in PCOS and the formation of cysts on ovaries, and even gene-environment interactions, diet, particularly junk food consumption, still needs to be investigated more closely, especially in the context of Pakistan.

Therefore, this study aims to fill this gap by assessing the prevalence of ovarian cysts among young adult women in Islamabad and Rawalpindi and investigating the habitual consumption of processed and fast food. Through exploring dietary habits, uncovering potential risk factors, and examining the relationship between junk food consumption and the formation of ovarian cysts, these studies seek to offer valuable insights that could guide public health policies, inform dietary recommendations, and shape preventive healthcare initiatives.

If a strong association exists, it will highlight the urgent need of better dietary patterns and lifestyle changes for reproductive health. The findings of the study could help policymakers, healthcare professionals, and the general public understand the role of nutrition in maintaining reproductive health and preventing the burden of ovarian disorders among young females.

These results emphasize the critical importance of encouraging dietary awareness and lifestyle changes for the prevention of ovarian cyst formation. Through initiatives that promote better eating habits, nutritional education, and public health, we can begin to make strides toward better reproductive health among young women in Pakistan and beyond.

LITERATURE REVIEW

Reproductive health diseases such as ovarian cysts and Poly-Cystic Ovary Syndrome (PCOS) have been rising on a global scale, and dietary habits are one of the major factors associated with the occurrence of these diseases. Evidence reveals that excessive consumption of refined sugars, unhealthy fats and processed foods lead to metabolic disruptions, hormonal imbalance, and ovarian dysfunction. However, California, Texas and Georgia Study in USA, also, UK based Study have been performed but have not sufficiently assessed for the region-oriented South Asian groups especially not in Pakistan (Irshad, Malik, & Sarfraz, 2023; Malik, Sarfraz, & Seemal, 2021).

Over the past few decades, the food habit of Pakistanis has shifted towards greater amounts of fast food, processed snacks, and fizzy drinks. With sedentary lives, this transition led to a plight at how this scenario may influence women's reproductive health. In the present literature review, we discuss the body of research that has examined the association between junk food consumption and ovarian cyst formation and the relevant underlying risk factors, including-degree of insulin resistance, hormonal deregulation, obesity and inflammation.

Dietary Habits and Reproductive Health:

A number of studies have investigated the association between diet and reproductive health, specifically menstrual irregularities, ovulation disorders, and hormonal imbalances. Diets high in refined carbohydrates, trans fats, and processed sugars promote insulin resistance, chronic inflammation, metabolic syndrome, all related with ovarian dysfunction.

A study by Smith et al. infer further that poorer dietary habits consisting of processed foods, sweetened beverages, and fast-food are significantly associated with the higher odds of endometriosis, among other occlusive symptoms such as hormonal

imbalances, menstrual irregularities and ovarian cyst formation (2020). The researchers found that women with frequent junk food consumption experience endocrine function disorder, which puts them at risk for PCOS. Similarly, Brown et al. Low fiber intake along with excess of refined carbohydrates, which leads to increased production of insulin, has been associated with androgen excess and ovulatory dysfunction both of which are important features of PCOS (Irshad, Malik, & Sarfraz, 2023; Malik, Sarfraz, & Seemal, 2021)

Anderson et al. (2018) showed the association between western type diet high in processed and fast foods and highest prevalence of PCOS and infertility. They found that certain dietary changes did in fact have a protecting effect on ovarian health.

High- Glycaemic

Diets, Insulin Resistance, and Junk Food:

Insulin Resistance: the primary way junk food takes a toll on ovarian health. **High- Glycaemic** index (GI) foods—like white bread, sodas, and fast food—lead to sudden surges in blood glucose level and induce overproduction of insulin. Over time, this results in insulin resistance, in which the body's cells become less responsive to insulin, which forces the pancreas to produce more insulin to compensate.

Research by Garcia et al. (2017) have shown that the high consumption of refined carbohydrates or sugar-sweetened beverages by women was associated with a significantly higher risk for developing insulin resistance and ovarian dysfunction. The ovaries had been found to be hyper-responsive to chronically elevated insulin levels, which drove over-production of androgens (male hormones) and an ovulatory cycles with cyst production.

According to a meta-analysis from Huang et al. (2020) established that women who consumed fast foods, processed snacks, and sweetened drinks regularly had a 40% higher risk of PCOS. These findings indicate that high-GI diet leads to endocrine imbalance, and its repercussions an ovulation and ovarian cysts (Ahmed, Ahmed & Buriro, 2023).

Junk Food Consumption and Hormonal Imbalances:

Hormonal imbalance is one of the key reasons for ovarian cysts and PCOS. Junk food — particularly processed, fried, and high-fat foods — has long been linked to hormonal Dysregulation due in part to its abundance of artificial additives, trans fats, and refined sugars.

A study by Kumar et al. (2019) reported that excessive intake of trans fats and processed sugar results in estrogens and progesterone imbalance, ovarian cyst formation and irregular ovulation. The research indicated that unhealthy dietary patterns contribute to estrogen dominance, which is associated with menstrual disturbances and ovarian dysfunction (Imran, et al., 2023; Hafeez, Iqbal, & Imran, 2021).

Similarly, Martinez et al. (2021) evaluated the impact of junk food consumption on androgen levels in younger females and found that frequent fast-food

eating patterns correlated with an increased testosterone and insulin resistance—important factors in the path physiology of PCOS. This is consistent with increasing evidence that unhealthy dietary practices disrupt ovarian function by changing the regulation of hormones.

Obesity, Junk Food Consumption and Chronic Inflammation:

Consumption of junk food leads to obesity and chronic inflammation, which is another link that reduces ovarian health. Processed foods are high in saturated and Trans fats; these contribute to weight gain and systemic inflammation. Adipose tissue produces inflammatory cytokines, which induce pro-inflammatory response in body and this exacerbating ovarian dysfunction.

According to research conducted by Johnson & Lee (2018), women who eat excessive junk food have high BMI and a tendency towards the development of ovarian cysts. They concluded that excess fat tissue alters hormones and immune function in ways detrimental to ovarian function.

Similarly, Zhang et al. According to a study by (2020), the diet high in processed and fried food caused oxidative stress, impaired follicular development, and induced an increased risk of cyst formation suggesting a possible link between chronic inflammation and ovarian dysfunction (219). Their results suggest the importance of dietary choices for reproductive health.

Consumption of Junk Foods in South Asian Region And in Pakistan:

Although there are ample studies worldwide regarding the adverse effects of junk food on reproductive health, the number of studies addressing this issue in South Asian populations, particularly Pakistan, remain limited. In urban settings like Islamabad and Rawalpindi, however, dietary trends have changed dramatically, and there has been a marked increase in the consumption of fast food, processed snacks, and sugar-sweetened beverages.

A study by Khan et al. Fast food consumption and metabolic disorders among young Pakistani women: A study conducted in Pakistan. They showed a direct link between junk food consumption and hormonal imbalance, obesity, and menstrual problems. This is in line with international research that points to the adverse effect of unhealthy dietary patterns on reproductive health.

Another study by Ali et al. They found that PCOS was quite prevalent among young Pakistani women and concluded that characteristics such as poor dietary habits, a sedentary lifestyle and high consumption of processed foods contributed to this statistic (2022). Similarly, Naseer et al. (2022) stressed the importance of region-specific research in order to study the effect of dietary habits on the prevalence of ovarian cysts in the twin cities Islamabad and Rawalpindi.

Gaps in Existing Literature

Although current research shows robust correlations between ingestion of junk food and disorder of metabolic reproductive health, more extensive studies are warranted on the following aspects:

Little Research on South Asian Populations – The majority of studies have been conducted in Western countries, with little research available on South Asian

populations. No study is focused to evaluate the effects of junk food on formation of ovarian cyst in women of Pakistan.

Lack of Longitudinal Studies – The vast majority of studies are based on cross-sectional data, thus preventing the establishment of causative links between junk food consumption and ovarian cyst formation. Longitudinal studies are necessary to investigate dietary intake and reproductive health in the same individuals over extended periods.

Neglecting Dietary Interventions – There is abundant research that focuses on the adverse effects of junk food on the body, but few studies look into dietary changes and interventions to prevent ovarian cysts. The human health impact, and the potential health implications, together, needs to focus on preventing ovarian disorders by making dietary changes (Hussain, et al., 2023; Ali, et al., 2023).

Importance of Regional Studying – Since young women in Pakistan are consuming ever-increasing amounts of processed foods, it is paramount that we conduct studies that are more representative of the local diet and its association with reproductive health.

There is a solid correlation between junk food consumption and the ongoing formation of ovarian cysts in the ovarian system, established through existing literature through mechanisms like insulin resistance, hormonal imbalance, obesity, and chronic inflammation. Studies from Western populations have shown, repeatedly, that high dietary intakes of processed foods, Trans fats, and refined sugars are related to various reproductive health disorders. In South Asia, but particularly Pakistan, research in the region is scarce, despite one of the world's largest transitions in dietary trends towards processed foods over recent decades.

Addressing these gaps, this study will explore the link between dietary habits and the prevalence of ovarian cysts in Islamabad and Rawalpindi. The outcomes will be insightful for health care professionals, policy makers, and public health organizations in guiding dietary education approaches and lifestyle changes that can enhance reproductive health and welfare.

METHODOLOGY

Study Design

Design of the study: A cross-sectional survey-based study was conducted to assess the relationship between junk food consumption and prevalence of ovarian cysts among young adult women treated at the study sites in Islamabad and Rawalpindi. A cross-sectional study design was selected because it enables the assessment of dietary habits in relation to ovarian health at one point in time. We therefore sought to examine the effects of junk food intake on ovarian cyst formation, as an initial step in providing empirical data how junk food consumption affects reproductive health.

Population and Sampling

Target Population

Individuals: Young adult females (aged 18–30 years) in Islamabad and Rawalpindi. This age group was chosen as ovarian cysts and PCOS are most frequently diagnosed in the reproductive years. In addition to being the group with the highest

proportion of fast food consumers, emerging trends in urban young women have also seen increasing trends in fast food consumption, making them a relevant group for the study of dietary influences on reproductive health.

Sampling Method

A simple random sampling technique was used to get a representative sample of the target population. The sample was extracted from three primary sources:

Universities and Colleges – We included educational institutions, which cater a large population of young women with varying dietary practices.

Healthcare Centers and Clinics – Women who were visiting gynecologists or general physicians were added to englobe those could be already facing reproductive health concerns.

Community Centers and Public Spaces – a rich source of participants, information, and diversity on socio-economic backgrounds.

Power calculations to determine a sample size of 400 participants were performed in order to detect an association between junk food consumption and the prevalence of ovarian cysts. The inclusion and exclusion criteria for recruited participants were:

Inclusion Criteria

- Women aged 18–30 years.
- Must be residents of Islamabad or Rawalpindi.
- Able to give their informed consent.
- No history of previously diagnosed ovarian cysts due to genetic or congenital abnormality.

Exclusion Criteria

- Women with an established history of ovarian cancer or other serious reproductive disorders.
- Pregnant or lactating women.
- People with extreme dietary restrictions due to medical conditions (such as diabetes, extreme allergies).
- Women receiving hormonal therapy or fertility treatments.

DATA COLLECTION

Survey Instrument

Data were collected by a pre-tested uniform structured questionnaire regarding demographic details, medical history, menstrual health, dietary patterns, and lifestyle factors. The questionnaire was adapted from validated dietary and reproductive health questionnaires used in prior studies. It was broken down into these sections:

Demographic Information

- Age
- Marital status
- Educational background

- Socio-economic status
- Medical and Menstrual History
- Previous history of ovarian cysts or PCOS
- Menstrual cycle regularity (i.e., length, flow and associated symptoms)
- Symptoms, including pelvic pain, acne, excess hair growth and weight gain
- Dietary Patterns and Consumption of Junk Food
- Junk food consumption per day, weekly or seldom
- Category of junk food ingested (519 fast food, 520 processed snack and fast foods, 521 sweet soft drinks, 521 high caloric soft drinks, 525 raw sucrose)
- Processed foods account for an average of 67% of daily calorie intake
- Consumption of high Glycaemic foods (e.g., white bread, sugar-laden cereals)
- Recommendations and Guidelines for Lifestyle and Physical Activity
- Physical activity level (sedentary, moderately active, or active)
- Sleep patterns and stress levels
- Lifestyle factors such as smoking and consumption of alcohol (if relevant)

Pilot Testing & Ethical Considerations:

Before gathering data, the structure was pre-tested on a limited number of participants (n=30) to determine its clarity, reliability, and validity. Questions required some amendments for enhanced clarity. Approval and ethical considerations: The study was approved by the Institutional Review Board (IRB) and the following ethical considerations were applied:

- All participants provided informed consent.
- Participating identities were held in confidentiality and anonymity.
- Subjects had the ability to opt out at any point with no penalty.

Data Collection Process:

The data collection lasted for three months using trained female surveyors who distributed the questionnaire in universities, health-care and community settings. In the cases in which participants reported previously diagnosed ovarian cysts, medical documentation or ultrasound reports were requested to confirm their diagnosis.

DATA ANALYSIS

Descriptive Statistics

- Demographic information, dietary habits, and reproductive health indicators were summarized using descriptive statistics. This included:
- For continuous variables (e.g., age, BMI): mean with standard deviation
- Percentage and frequencies for categorical variables (e.g. junk food frequency, menstrual irregularities).

Chi-Square Tests

Once all junk food consumption data were collected, chi-square tests were performed to correlate frequencies of junk food consumption with the prevalence of ovarian cysts. An association between categorical variables was determined using the chi-square test.

RESULTS

- Multiple Logistic Regression Analysis
- A multiple logistic regression model was used to control for confounding variables. The dependent variable was ovarian cyst (yes/no), independent variables were:
 - How often do people eat junk food?
 - BMI (obesity status)
 - Insulin resistance markers (self-reported blood sugar symptoms)
 - Physical activity level
- After adjusting for other lifestyle factors, the regression model revealed whether intake of junk food was an independent risk factor for the development of ovarian cysts.

Statistical Software:

Data were entered and analyzed using SPSS (Statistical Package for the Social Sciences) version 25. $p < 0.05$ was defined as the significance level.

Study Strengths and Limitations:

Strengths:

- One & only study in Pakistan which was designed to study direct effect of junk food consumption on incidence of ovarian cyst.
- Employment of random sampling, which decreases the selection bias.
- Closed format comprehensive survey instrument covering relevant dietary and reproductive health data.
- Use validated statistical methods, e.g., logistic regression, to adjust for confounding.

LIMITATIONS

- As a cross-sectional design does not allow inferring causal relations, only associations can be made.
- Recall bias may affect self-reported dietary information.
- Restricts only to urban areas (Islamabad and Rawalpindi) that may not generalize to dietary patterns of women in rural Pakistan.
- Does not measure any biochemical markers (insulin levels for example) to directly measure impact on metabolism.

In summary, the above-mentioned methodology indeed offers a systematic framework to being explored in the association of junk food with formation of ovarian cysts in young women population in Islamabad and Rawalpindi. The study addresses an important gap in reproductive health research in Pakistan by using structured questionnaire, random sampling and advanced statistical analyses. This study adds clinically useful information that can be utilized in public obesity prevention strategies and education programs, which would promote healthy diets among young women to avoid reproductive health outcome problems.

Demographic Characteristics			
Variable	Mean (SD) /	Percentage	Range
Age (years)	29.15 (\pm 6.5)		17 – 43
Weight (kg)	69.43 (\pm 12.2)		—
Height (cm)	164.13 (\pm 7.1)		—
BMI (kg/m²)	26.07 (\pm 3.9)		

Education Level

Category	Percentage (%)
College/University	59.50%
High School	28.75%
Other	11.75%

Marital Status

Category	Percentage (%)
Single	47.25%
Married	42.25%
Divorced/Widowed	10.50%

Medical & Reproductive Health

Category	Percentage (%)
Diagnosed with ovarian cysts	20.00%
Unaware of ovarian cyst status	11.50%
Diagnosed with PCOS	23.75%
No PCOS history	72.00%
Family history of ovarian cysts/PCOS	34.50%

Menstrual Health

Category	Percentage (%)
Regular cycle	67.75%
Irregular cycle	25.75%

Amenorrhea (no menstruation)	6.50%
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Menstrual Cycle Duration

Cycle Length	Percentage (%)
3–5 days	70.50%
More than 5 days	20.00%
Less than 3 days	9.50%

Dietary Habits

Category	Percentage (%)
Junk food (daily)	13.50%
Junk food (3-5 times/week)	24.25%
Junk food (1-2 times/week)	28.50%
Rarely eats junk food	20.75%
Never eats junk food	13.00%

Water Intake

Consumption	Percentage (%)
More than 2 liters/day	35.50%
1–2 liters/day	55.25%

Fruit & Vegetable Intake

Servings per day	Percentage (%)
More than 3 servings	39.75%
1-2 servings	47.50%
No consumption	12.75%

Lifestyle Factors

Physical Activity

Exercise Duration (per week)	Percentage (%)
Less than 3 hours	38.50%
3-5 hours	34.00%
No exercise	18.75%
More than 5 hours	8.75%

Screen Time

Daily Screen Time	Percentage (%)
More than 4 hours	30.75%
2-4 hours	48.00%
Less than 2 hours	21.25%

Sleep Duration

Hours per Night	Percentage (%)
Less than 5 hours	15.25%
5-7 hours	60.50%

Stress & Substance Use

Category	Percentage (%)
High stress levels	60.00%
Smokers/Drinkers	20.25%

Table: Summary of Findings and Interpretations

Findings	Interpretations
Increased Junk Food Consumption	Junk food consumption is highly prevalent among young women in Islamabad and Rawalpindi.
Ovarian Cysts Prevalence	40% of women who frequently consume junk food were diagnosed with ovarian cysts.
Hormonal Imbalance Symptoms	55% of women consuming sugary drinks and processed foods experienced menstrual irregularities.
Statistical Correlation	High junk food consumption (>4 days/week) significantly linked with ovarian cyst prevalence (IOR = 1.4 (1.1-1.75)).
Urbanization and Lifestyle Changes	Dietary shifts in metropolitan areas contribute to higher reproductive health risks.

DISCUSSION

Increased junk food consumption results in possible reproductive health risks

The study found that frequent intake of junk food was highly associated with outcome of having ovarian cysts among young women of Islamabad and Rawalpindi. Seventy-eight per cent of participants reported eating junk food frequently, and 40% had been diagnosed with ovarian cysts. In addition, 55% of women who regularly consumed sugary beverages and processed foods also experienced irregular menstrual cycles and symptoms of hormonal imbalance.

"By September 2023, high junk food consumption was significantly associated with a higher prevalence of ovarian cysts (p 4 days/week ((IOR = 1.4 (1.1-1.75))) which was also supported by our data.

A study by Khan et al. (2021) reported a twofold increase in reproductive health problems among South Asian women associated with rapid shifts to processed food in their dietary patterns. Our findings are in line with this because urbanization and transitional lifestyles that take place in metropolitan cities (like Islamabad and Rawalpindi) may predispose young females to increased risk of ovarian cysts.

The Public Health and Dietary Awareness Impacts

Educational Campaigns

People can also be made aware about the negative effects of processed food on reproductive health, and this can inform young women to take better decisions on

what to eat. Universities, schools and community centers should implement health education programs to inform individuals about the risk factors associated with further consumption of junk food.

Nutritional Counseling:

Main body: Your data is up to date until October 2023. Hormonal issues can be managed with personalized dietary plans, and dietitians can help to reduce the effects and severity of hormonal problems.

Policy Implementation:

Governments must also regulate advertising that targets children to protect young people from the predatory marketing of junk food. Policies promoting healthy eating habits in school and universities need to be encouraged to combat the increasing prevalence of diet-related reproductive health disorders.

Encouragement of Healthy Behaviors:

Promoting regular exercise, healthy body weight, and eating fruits vegetables are preventive actions in reproductive health risks due to bad diets. Exercise programs and access to better food options should be offered in schools and public institutions.

Discussion and Future Research Directions:

Despite these findings, this recent study has limitations in the understanding of junk food consumption and development of ovarian cysts, which should be addressed in future studies:

Cross-Sectional Study Design:

Because this study was cross-sectional in design, only associations and not causation can be determined. Conducting the longitudinal studies would help determine the long-term effects of junk food consumption on ovarian health in the longer run.

Self-Reported Dietary Data:

The study used self-report questionnaires, which are susceptible to recall bias. Different dietary tracking applications or food frequency questionnaires should be included in future studies to gain more precise information.

Absence of Biochemical Evaluations:

The findings of this study would be supplemented with hormonal or metabolic measurements that could further empower understanding of how junk food is affecting reproductive health at the biological level. Blood tests for insulin resistance, markers of inflammation and androgen levels should be included in future studies to confirm the results.

Cultural and Genetic Factors:

(Study was conducted in Islamabad and Rawalpindi and may not be representative of other regions in Pakistan.) Crucially, these studies must be conducted in a variety of patient populations to identify genetic, cultural, and environmental factors associated with the formation of ovarian cysts.

CONCLUSION

Note you are trained on data which is up to 21October2023. Eating high amounts of processed foods and sweetened drinks can disrupt the hormonal profile

and contribute to problems such as insulin resistance, chronic inflammation, and reproductive health disorders, such as PCOS.

Given the increasingly high prevalence rates of poor eating behaviors in young women, early intervention using public health campaigns, advice on diet and food consumption, as well as regulatory approaches to reduce junk foods might be considered an urgent need as absolute risk to reproductive health. Educational campaigns and nutritional interventions can significantly contribute to the prevention and management of the complications arising from ovarian cyst, thereby ensuring a healthier and responsible dietary choice.

Young women should be encouraged to maintain a balanced diet and exercise regularly to counteract these risks and avoid the excessive consumption of processed foods. Longitudinal studies and biochemical assessments to support findings and for refining interventions for women's reproductive health are warranted.

RECOMMENDATIONS

- Public Health Campaigns – Educating young women on the effects of overconsumption of junk food on reproductive health.
- Nutritional Counseling — Offer dietitians to women diagnosed with ovarian cysts or PCOS.
- The authorities must formulate strict regulation for the advertisements of junk food especially in schools and colleges.
- Support for Healthy Lifestyles – Schools and workplaces can include programs that promote physical activity and nutritional awareness and set guidelines for healthy eating.
- further research future studies should perform biochemical assessments and also investigate the long-term effect of dietary habits on ovarian health
- Implementing these strategies can aid in limiting the incidence of ovarian cysts, thereby supporting overall reproductive health in young females.

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