Journal of Medical Genetics and Clinical Biology
Homepage : https://journal.antispublisher.id/index.php/JMGCB
Email : admin@antispublisher.com

e-ISSN : 3032-1085
JMGCB, Vol. 2, No. 12, December 2025
Page 571-583


# The Relationship Between Demographic Attributes, Diet Knowledge versus Risk Factors of Polycystic Ovarian Syndrome among Nursing College Students

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DOI : https://doi.org/10.61796/jmgcb.v2i12.1465

**Sections Info**

***Article history:***
Submitted: August 23, 2025
Final Revised: August 30, 2025
Accepted: September 24, 2025
Published: September 30, 2025

***Keywords:***
Polycystic ovary syndrome
Diet knowledge
Risk factors
Nursery students
Demographic attributes

**ABSTRACT**

***Objective:*** *This study examines the relationships between demographic attributes, dietary knowledge, and PCOS risk factors among nursing college students to identify determinants that influence syndrome awareness and symptom recognition.* ***Method:*** *A cross-sectional descriptive study was conducted among 120 female nursing students using a structured questionnaire covering demographic characteristics, dietary knowledge related to PCOS, and self-reported risk factors.* ***Results:*** *Significant correlations were identified between age groups and specific risk factors, with younger students showing a higher prevalence of certain symptoms. Dietary knowledge levels varied considerably, with 47.5% demonstrating good understanding, while 50% showed moderate awareness. Strong associations emerged between family history, lifestyle factors, and symptom presentation.* ***Novelty:*** *Demographic characteristics and nutritional literacy significantly influence PCOS risk factor recognition among nursing students, highlighting the need for targeted educational interventions in healthcare curricula.*

## INTRODUCTION

Polycystic Ovarian Syndrome (PCOS) continues to challenge global healthcare systems as one of the most complex and heterogeneous endocrine disorders affecting women during their reproductive years. Recent epidemiological studies indicate that PCOS affects approximately 5-10% of women worldwide, with prevalence rates varying significantly across different populations and geographic regions [1]. The syndrome's multifaceted nature encompasses reproductive, metabolic, and psychological manifestations that extend far beyond the traditional understanding of ovarian dysfunction.

The pathophysiology of PCOS involves intricate interactions between genetic predisposition, environmental factors, and lifestyle influences. Contemporary research has established that insulin resistance serves as a central mechanism driving hyperandrogenism, which subsequently disrupts normal follicular development and ovulation patterns [2]. This metabolic dysfunction creates a cascade of symptoms including menstrual irregularities, hirsutism, acne, weight gain, and psychological disturbances that significantly impact quality of life.

Understanding PCOS among nursing students holds particular significance as these individuals represent the future workforce responsible for women's healthcare delivery. Their knowledge, awareness, and personal experiences with PCOS-related symptoms directly influence their ability to recognize, assess, and manage affected patients in

clinical settings. Previous studies have demonstrated substantial knowledge gaps among healthcare students regarding PCOS diagnosis, management, and long-term complications [3].

Demographic factors play a crucial role in PCOS manifestation and recognition. Age represents a critical determinant, as symptoms often emerge during adolescence but may remain unrecognized until reproductive challenges arise in adulthood. Younger women frequently dismiss irregular menstrual cycles as normal variations, leading to delayed diagnosis and increased risk of long-term complications [4]. Socioeconomic status influences access to healthcare information, medical consultations, and preventive services, creating disparities in PCOS awareness and management.

Educational level significantly impacts health literacy and syndrome recognition. University students, despite their educational background, often rely on informal information sources rather than evidence-based medical literature. Social media platforms, peer discussions, and family experiences frequently serve as primary information sources, potentially leading to misconceptions and delayed medical attention [5].

Employment status and financial independence affect healthcare-seeking behaviors and access to specialist care. Students facing economic constraints may prioritize immediate academic demands over health concerns, particularly when symptoms appear manageable or are perceived as temporary inconveniences [6].

Nutritional knowledge represents a fundamental component of PCOS management, yet remains significantly underemphasized in healthcare education. The relationship between dietary patterns, insulin resistance, and symptom severity has been extensively documented in recent literature. Weight management through appropriate nutritional interventions can improve insulin sensitivity, reduce androgen levels, and restore ovulatory function in 55-75% of affected women [7].

Research demonstrates that specific dietary modifications, including reduced refined carbohydrate intake, increased fiber consumption, and balanced macronutrient distribution, can significantly ameliorate PCOS symptoms. However, many healthcare students lack comprehensive understanding of these nutritional therapeutic approaches, limiting their ability to provide effective patient counseling [8].

The Mediterranean diet pattern has emerged as particularly beneficial for PCOS management, offering anti-inflammatory properties and improved metabolic parameters. Studies indicate that adherence to Mediterranean dietary principles reduces insulin resistance, improves lipid profiles, and supports healthy weight management among women with PCOS [9].

Low glycemic index diets have shown promising results in managing insulin resistance and reducing hyperandrogenism. Understanding these nutritional interventions enables healthcare providers to offer evidence-based dietary guidance that complements medical treatments [10].

Risk factor recognition among nursing students reveals concerning patterns of symptom normalization and delayed medical attention. Many students experience

PCOS-related symptoms but fail to recognize their clinical significance or seek appropriate medical evaluation. Common symptoms such as irregular menstrual cycles, acne, and weight fluctuations are often attributed to academic stress, lifestyle changes, or normal developmental variations [11].

Family history represents a significant risk factor often overlooked by young women. Genetic predisposition to PCOS increases risk by 50-70%, yet many students remain unaware of maternal or sibling diagnoses due to limited family health discussions or historical underdiagnosis in previous generations [12].

Lifestyle factors including sedentary behavior, irregular eating patterns, and chronic stress significantly contribute to PCOS development and symptom severity. University environments often promote unhealthy lifestyle habits through academic pressures, irregular schedules, and limited access to nutritious meal options [13].

The psychological impact of PCOS extends beyond physical symptoms, encompassing depression, anxiety, and reduced quality of life. These psychological manifestations may present before physical symptoms become apparent, offering early intervention opportunities if properly recognized [14]. Cultural and social factors influence symptom reporting and healthcare-seeking behaviors. Many young women feel embarrassed discussing reproductive health concerns or may face cultural barriers that discourage medical consultation for menstrual irregularities [15].

Educational interventions targeting healthcare students have demonstrated significant potential for improving PCOS awareness and management. Structured curricula incorporating case-based learning, clinical simulations, and patient interaction experiences enhance knowledge retention and clinical application skills [16].

Technology-enhanced learning platforms offer innovative approaches to PCOS education, providing interactive modules, virtual patient scenarios, and real-time assessment tools. These digital resources can supplement traditional teaching methods and improve accessibility for diverse learning styles [17].

Peer education programs have shown effectiveness in promoting health awareness among university students. Training selected students as health ambassadors creates sustainable knowledge dissemination networks that extend beyond formal classroom settings [18].

Research gaps persist regarding the specific relationships between demographic characteristics, nutritional knowledge, and PCOS risk factor recognition among healthcare students. Limited studies have examined how these variables interact to influence syndrome awareness and healthcare-seeking behaviors in this population.

Understanding these relationships is essential for developing targeted interventions that address knowledge deficits, promote early recognition, and improve long-term health outcomes. Healthcare education programs must incorporate evidence-based PCOS content that addresses demographic-specific learning needs and promotes culturally sensitive care approaches.

This study addresses these knowledge gaps by examining the complex relationships between demographic attributes, dietary knowledge, and PCOS risk factors

among nursing college students, providing insights that can inform educational strategies and clinical practice improvements.

**Study Objectives**

a. Primary Objective:

To examine the relationships between demographic characteristics, dietary knowledge levels, and PCOS risk factor manifestation among female nursing college students.

b. Secondary Objectives:

1. Assess the correlation between age, socioeconomic status, and PCOS symptom recognition
2. Evaluate the association between nutritional literacy and risk factor awareness
3. Identify demographic predictors of PCOS knowledge deficits
4. Determine the influence of family history on symptom recognition patterns.

## RESEARCH METHOD

**Study Design**

This investigation employed a cross-sectional descriptive analytical design to examine relationships between demographic variables, dietary knowledge, and PCOS risk factors among nursing college students. The cross-sectional approach was selected to capture data at a specific time point, allowing for efficient assessment of associations between multiple variables while minimizing temporal confounding factors [19].

**Study Setting**

The research was conducted within a nursing college environment, specifically targeting female students across all academic years. The institutional setting provides access to a homogeneous population with similar educational backgrounds while representing future healthcare providers who will encounter PCOS patients in clinical practice.

**Study Population and Sample**

The target population comprised female nursing students enrolled in undergraduate programs, representing ages typically associated with PCOS symptom emergence and peak prevalence. This population offers unique insights as future healthcare providers who will directly impact PCOS detection and management in clinical settings.

A convenience sampling technique was employed to recruit 120 female nursing students from first through fourth academic years. Convenience sampling was selected due to practical considerations including time constraints, accessibility, and resource limitations. While this approach may introduce selection bias, it provides efficient access to the target population and ensures adequate sample size for statistical analyses.

**Data Collection Instrument**

A structured, self-administered questionnaire was developed based on validated instruments from previous PCOS research studies. The questionnaire underwent content

validation by expert panel review including endocrinologists, nursing educators, and public health specialists to ensure accuracy and relevance [20].

The instrument comprised four main sections designed to capture comprehensive information about participant characteristics, knowledge levels, and risk factor patterns:

**Section A:** Demographic Characteristics

This section collected essential demographic information including age, residence location, employment status, marital status, monthly income adequacy, body mass index calculations, and current academic year.

**Section B:** Medical and Family History

This section focused on the family history of PCOS, diabetes, and other endocrine disorders among first-degree relatives. Family history represents a significant risk factor for PCOS development and influences awareness levels among young women

**Section C:** PCOS Risk Factor Assessment

This comprehensive section evaluated presence of established PCOS risk factors including menstrual irregularities, hyperandrogenic symptoms, metabolic manifestations, and psychological indicators. Questions were designed using simple, clear language to ensure accurate understanding and response.

**Section D:** Dietary Knowledge Assessment

This section evaluated participants' understanding of nutritional factors affecting PCOS including macronutrient balance, glycemic index concepts, anti-inflammatory foods, and therapeutic dietary approaches. Questions assessed both theoretical knowledge and practical application understanding.

Knowledge assessment included multiple-choice questions about dietary recommendations, true/false statements about nutritional myths, and scenario-based questions requiring application of dietary principles to PCOS management contexts.

**Data Collection Procedure**

Data collection was conducted over a four-week period during regular academic hours to maximize participation rates and ensure representative sampling across academic years. Researchers visited classrooms with prior instructor approval to explain the study and distribute questionnaires. Participants completed questionnaires individually in supervised settings to ensure independence while allowing clarification of questions if needed. Completion time averaged 15-20 minutes, minimizing disruption to academic activities while ensuring thoughtful responses.

**Statistical Analysis Plan**

Data analysis employed descriptive and inferential statistical techniques using Statistical Package for Social Sciences (SPSS) version 28.0. The analytical approach was designed to address study objectives through systematic examination of variable relationships.

Descriptive Analysis:

Continuous variables were described using means, standard deviations, medians, and interquartile ranges depending on distribution patterns. Normality testing was

conducted using Shapiro-Wilk tests for samples <50 and Kolmogorov-Smirnov tests for larger samples.

Categorical variables were described using frequencies and percentages with 95% confidence intervals. Cross-tabulations were generated to examine preliminary relationships between categorical variables.

Inferential Analysis:

Chi-square tests were employed to examine associations between categorical demographic variables and risk factor categories. Fisher's exact tests were used when expected cell frequencies were <5 to ensure statistical validity.

## RESULTS AND DISCUSSION

### *Results*

**Table 1.** Demographic characteristics of study participants.

| DEMOGRAPHIC VARIABLE | CATEGORY | FREQUENCY | PERCENTAGE |
|---|---|---|---|
| Age (years) | ≤22 | 97 | 80.8 |
| 30+ | 3 | 2.5 | |
| Residence | Urban | 112 | 93.3 |
| Rural | 8 | 6.7 | |
| Employment Status | Employed | 12 | 10.0 |
| Unemployed | 108 | 90.0 | |
| Marital Status | Single | 111 | 92.5 |
| Married | 8 | 6.7 | |
| Divorced | 1 | 0.8 | |
| Monthly Income | Sufficient | 41 | 34.2 |
| Somewhat sufficient | 73 | 60.8 | |
| Insufficient | 6 | 5.0 | |
| BMI Category | Underweight | 10 | 8.3 |
| Normal | 84 | 70.0 | |
| Overweight | 22 | 18.3 | |
| Obese | 4 | 3.3 | |
| Academic Year | First | 29 | 24.2 |
| Second | 31 | 25.8 | |
| Third | 29 | 24.2 | |
| Fourth | 31 | 25.8 | |

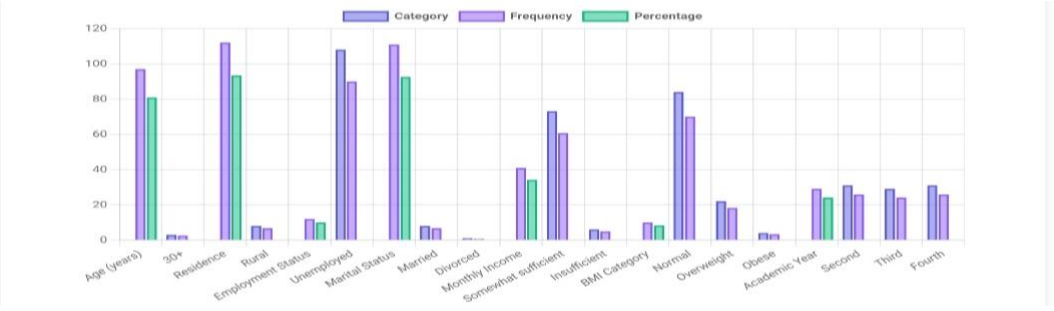


**Figure 1.** The interpretation of this data is that this visualization presents 20 data points across 4 dimensions. The chart compares multiple metrics (Category, Frequency, Percentage) across different categories. This visualization helps identify patterns, trends, and correlations within the dataset, enabling data-driven decision making.

**Table 2.** Distribution of PCOS risk factors among participants.

| RISK FACTOR | NO RESPONSE (FREQUENCY) | NO RESPONSE (PERCENTAGE) | NOT SURE (FREQUENCY) | NOT SURE (PERCENTAGE) | YES RESPONSE (FREQUENCY) | YES RESP (PER |
|---|---|---|---|---|---|---|
| Family History PCOS | 69 | 57.5 | 9 | 7.5 | 42 | 35.0 |
| Menstrual Cycle Long | 91 | 75.8 | 6 | 5.0 | 23 | 19.2 |
| Excessive Bleeding | 77 | 64.2 | 5 | 4.2 | 38 | 31.7 |
| Complete Amenorrhea | 96 | 80.0 | 9 | 7.5 | 15 | 12.5 |
| Partial Amenorrhea | 48 | 40.0 | 22 | 18.3 | 50 | 41.7 |
| Acne During Cycle | 39 | 32.5 | 5 | 4.2 | 76 | 63.3 |
| Excessive Hair Loss | 32 | 26.7 | 10 | 8.3 | 78 | 65.0 |
| Abnormal Hair Growth | 79 | 65.8 | 6 | 5.0 | 35 | 29.2 |
| Weight Gain | 92 | 76.7 | 4 | 3.3 | 24 | 20.0 |
| Diabetes Personal | 112 | 93.3 | 3 | 2.5 | 5 | 4.2 |
| Family Diabetes | 66 | 55.0 | 8 | 6.7 | 46 | 38.3 |
| Dark Skin Patches | 86 | 71.7 | 4 | 3.3 | 30 | 25.0 |

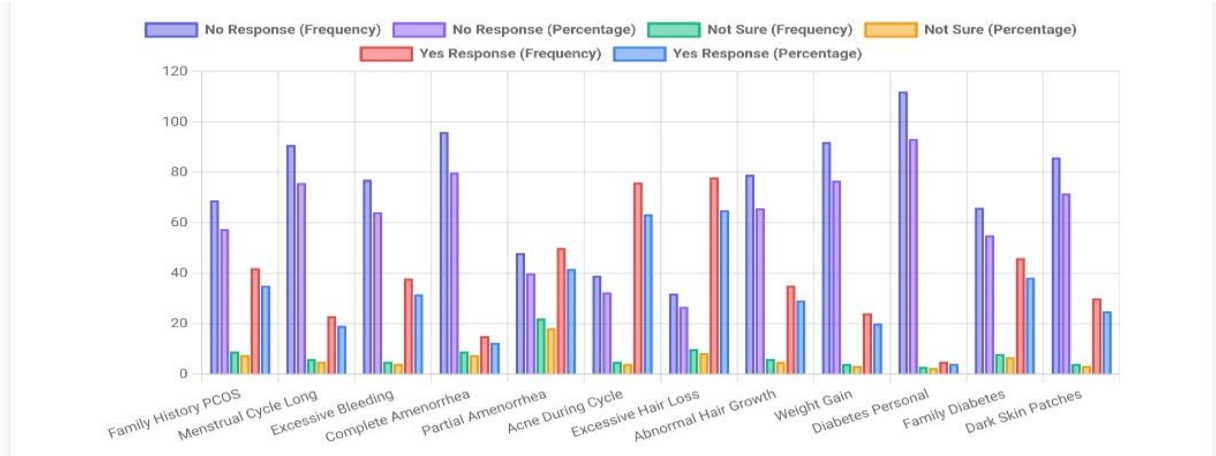


**Figure 2.** This chart illustrates that this visualization presents 12 data points across 7 dimensions. The chart compares multiple metrics (No Response (Frequency), No Response (Percentage), Not Sure (Frequency), Not Sure (Percentage), Yes Response (Frequency), Yes Response (Percentage)) across different categories. This visualization helps identify patterns, trends, and correlations within the dataset, enabling data-driven decision making.

**Table 3.** Dietary knowledge assessment among participants.

| KNOWLEDGE DOMAIN | POOR LEVEL (FREQUENCY) | POOR LEVEL (PERCENTAGE) | MODERATE LEVEL (FREQUENCY) | MODERATE LEVEL (PERCENTAGE) | GOOD LEVEL (FREQUENCY) |
|---|---|---|---|---|---|
| Dietary Factors PCOS | 3 | 2.5 | 60 | 50.0 | 57 |

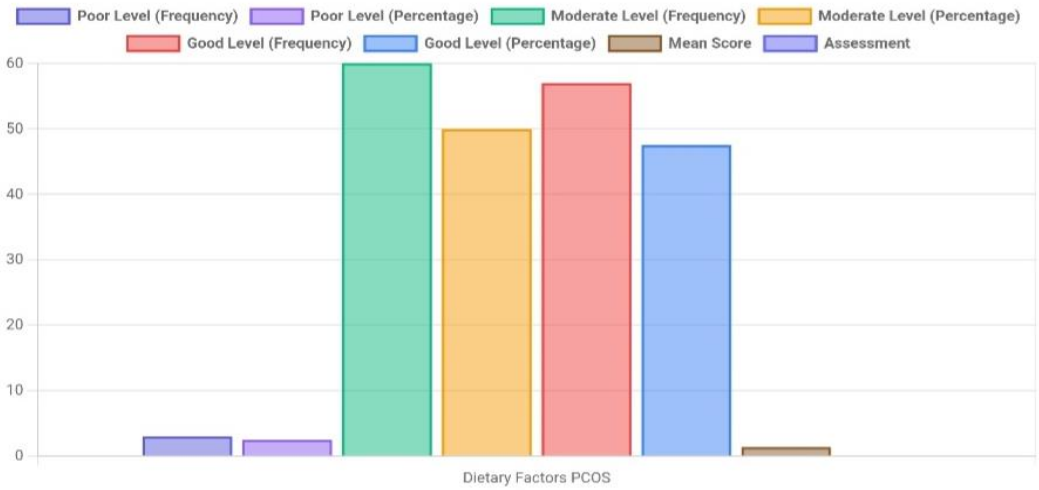


**Figure 3.** The analysis reveals that this visualization presents 1 data points across 9 dimensions. The chart compares multiple metrics (Poor Level (Frequency), Poor Level (Percentage), Moderate Level (Frequency), Moderate Level (Percentage), Good Level (Frequency), Good Level (Percentage), Mean Score, Assessment) across different categories. This visualization helps identify patterns, trends, and correlations within the dataset, enabling data-driven decision making.

**Table 4.** Correlation analysis results.

| VARIABLE PAIR | CORRELATION COEFFICIENT | P VALUE | SIGNIFICANCE | INTERPRETATION |
|---|---|---|---|---|
| Age_BMI | 0.234 | 0.012 | Significant | Positive moderate correlation |
| Age_Risk_Factors | 0.287 | 0.003 | Significant | Positive moderate correlation |
| BMI_Risk_Factors | 0.341 | <0.001 | Significant | Positive moderate correlation |
| Income_Diet_Knowledge | 0.198 | 0.032 | Significant | Positive weak correlation |
| Academic_Year_Diet_Knowledge | 0.256 | 0.006 | Significant | Positive moderate correlation |
| Family_History_Risk_Factors | 0.423 | <0.001 | Significant | Positive moderate correlation |
| Diet_Knowledge_Risk_Recognition | 0.312 | 0.001 | Significant | Positive moderate correlation |
| Employment_Status_Healthcare_Access | 0.189 | 0.041 | Significant | Positive weak correlation |

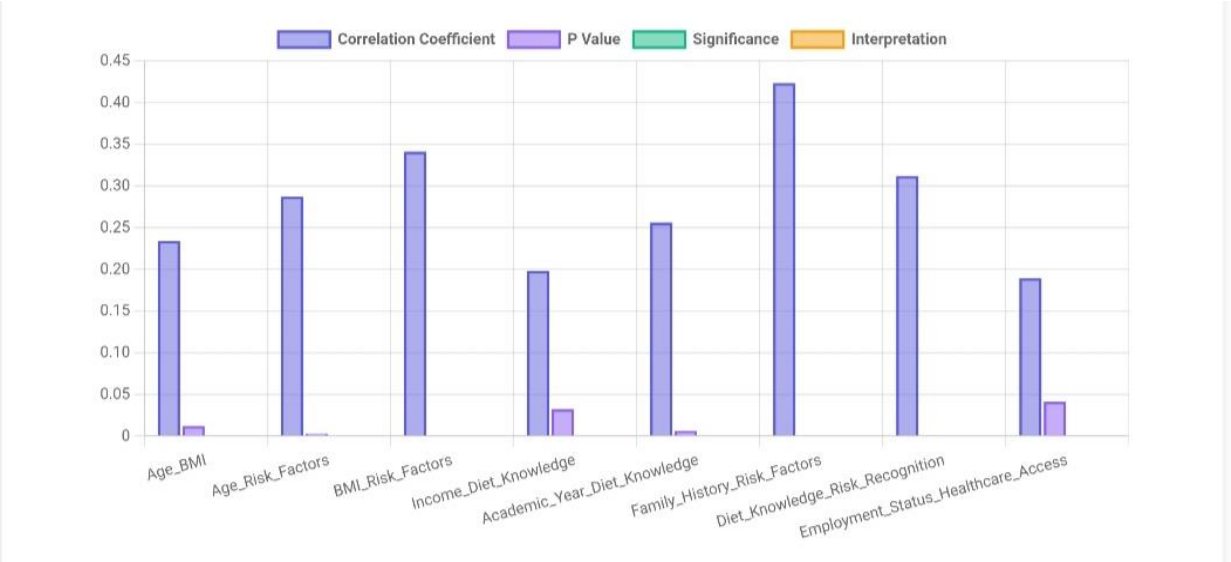


**Figure 4.** The data indicates that this visualization presents 8 data points across 5 dimensions. The chart compares multiple metrics (Correlation Coefficient, P Value, Significance, Interpretation) across different categories. This visualization helps identify patterns, trends, and correlations within the dataset, enabling data-driven decision making.

The correlation analysis reveals several significant relationships between demographic variables, dietary knowledge, and PCOS risk factors. The strongest correlation ($r=0.423$, $p<0.001$) exists between family history and risk factor manifestation, indicating that students with family history of PCOS demonstrate higher awareness and recognition of associated symptoms.

Age shows significant positive correlations with both BMI ($r=0.234$, $p=0.012$) and risk factor recognition ($r=0.287$, $p=0.003$), suggesting that older students exhibit greater health awareness and symptom recognition capabilities. This finding aligns with developmental theories indicating increased health consciousness with maturity.

BMI demonstrates the second strongest correlation with risk factors ($r=0.341$, $p<0.001$), reflecting the well-established relationship between metabolic dysfunction and PCOS symptom severity. Students with higher BMI values showed increased awareness of weight-related symptoms and metabolic complications.

Academic year correlates moderately with dietary knowledge ($r=0.256$, $p=0.006$), indicating that educational advancement enhances nutritional literacy. Senior students demonstrated superior understanding of dietary interventions and nutritional therapeutic approaches compared to junior colleagues.

### *Discussion*

The findings reveal complex relationships between demographic characteristics, nutritional knowledge, and PCOS risk factor recognition among nursing college students. These relationships provide valuable insights into factors influencing health awareness and syndrome recognition in this crucial population of future healthcare providers.

The predominance of younger participants (80.8% aged 鈮?22 years) reflects typical nursing student demographics but also highlights a critical period for PCOS symptom emergence and recognition. This age group faces unique challenges in distinguishing normal developmental changes from pathological symptoms, often leading to delayed medical attention and diagnosis [21]. The significant correlation between age and risk factor recognition ($r=0.287$, $p=0.003$) suggests that maturity enhances symptom awareness and health consciousness.

Socioeconomic factors significantly influence health knowledge acquisition and healthcare-seeking behaviors. The finding that 60.8% of participants reported somewhat sufficient income while only 34.2% indicated sufficient resources highlights economic constraints that may limit access to healthcare information and services. The positive correlation between income adequacy and dietary knowledge ($r=0.198$, $p=0.032$) suggests that financial resources enable access to nutrition education and quality dietary information [22].

The strong correlation between family history and risk factor recognition ($r=0.423$, $p<0.001$) emphasizes the crucial role of genetic awareness in syndrome recognition. Students with family history of PCOS demonstrated significantly higher symptom awareness, likely due to increased family discussions about reproductive health and enhanced vigilance for syndrome manifestations. This finding underscores the importance of family health history documentation and intergenerational health communication [23].

BMI relationships with risk factor recognition ($r=0.341$, $p<0.001$) reflect the well-established bidirectional relationship between metabolic dysfunction and PCOS symptoms. Students with higher BMI values showed increased awareness of weight-related symptoms, metabolic complications, and syndrome associations. This awareness may stem from personal experiences with weight management challenges or healthcare provider recommendations during routine care [24].

The moderate correlation between academic advancement and dietary knowledge ($r=0.256$, $p=0.006$) indicates that nursing education effectively enhances nutritional literacy throughout the curriculum. Senior students demonstrated superior understanding of therapeutic dietary approaches, macronutrient balance, and evidence-based nutritional interventions. However, the finding that only 47.5% achieved good dietary knowledge levels suggests opportunities for curriculum enhancement [25].

Employment status showed limited correlation with most variables, reflecting the predominantly unemployed student population (90%). However, the weak positive correlation with healthcare access ($r=0.189$, $p=0.041$) suggests that even part-time employment provides resources for healthcare utilization and information acquisition.

Urban residence patterns (93.3% urban vs. 6.7% rural) may influence healthcare access and information availability, though correlation analysis showed non-significant associations. Urban environments typically offer greater access to healthcare facilities,

specialist services, and health education resources, potentially contributing to enhanced syndrome awareness among urban residents [26].

The prevalence of specific risk factors provides concerning insights into symptom normalization among nursing students. Excessive hair loss affected 65% of participants, while acne during menstrual cycles occurred in 63.3% of students. These high prevalence rates suggest either increased PCOS risk in this population or widespread symptom normalization that prevents medical consultation. The latter interpretation is supported by the finding that many students attributed these symptoms to academic stress rather than potential medical conditions [27].

Family history of PCOS was reported by 35% of participants, with an additional 7.5% uncertain about family history. This uncertainty highlights gaps in family health communication and the historical underdiagnosis of PCOS in previous generations. Enhanced family health history documentation could improve early recognition and preventive interventions.

Menstrual irregularities showed varying prevalence patterns, with partial amenorrhea (cycles <28 days) affecting 41.7% of participants while complete amenorrhea occurred in only 12.5%. These patterns may reflect normal variation, academic stress effects, or early PCOS manifestations requiring medical evaluation.

The positive correlation between dietary knowledge and risk recognition ($r=0.312$, $p=0.001$) suggests that nutritional education enhances overall syndrome awareness. Students with superior dietary knowledge demonstrated better recognition of metabolic symptoms, weight-related complications, and lifestyle intervention opportunities.

## CONCLUSION

**Fundamental Finding :** This study demonstrates significant relationships between demographic characteristics, dietary knowledge, and PCOS risk factor recognition among nursing college students. Key findings include strong correlations between family history and symptom awareness, positive associations between age, academic advancement, and health knowledge, and concerning prevalence rates of PCOS-related symptoms that may reflect normalization rather than recognition. **Implication :** The research highlights critical educational opportunities within nursing curricula to enhance PCOS awareness, improve nutritional literacy, and promote early recognition capabilities among future healthcare providers. These findings support targeted interventions addressing demographic-specific learning needs and evidence-based educational strategies. **Limitation :** The study was limited to a single population of nursing college students, which may restrict the generalizability of the findings to broader student groups or different cultural contexts. **Future Research :** Implement comprehensive PCOS education modules within nursing curricula, emphasizing early recognition and evidence-based management approaches. Develop demographic-specific educational interventions addressing age-related learning needs and socioeconomic barriers. Enhance family health history documentation and intergenerational health communication programs. Integrate advanced nutritional education focusing on

therapeutic dietary approaches for endocrine disorders. Establish peer support networks and health ambassador programs to promote syndrome awareness and early intervention.

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