European Journal of Clinical Pharmacy

Print ISSN: 2385-409X **Online ISSN**: 3105-0409

Website: https://farmclin.com/

Original Case Report

Study on association of dietary habits in Polycystic ovary syndrome (PCOS) women with normal Body mass index (BMI)

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Received*: 28-*03-*2026*

Revised*:* 26-04-2026

Accepted*:* 12-05-2026

Published*: 17-*05-2026

Abstract: **Background:** Polycystic ovary syndrome (PCOS) is a prevalent endocrine disorder affecting 6-20% of reproductive-age women globally. While metabolic abnormalities are frequently associated with PCOS, a significant proportion of affected women maintain normal body weight. Despite this, lean women with PCOS demonstrate similar metabolic and reproductive dysfunction compared to their overweight counterparts. Dietary modifications have emerged as a promising non-pharmacological management strategy; however, evidence regarding specific dietary patterns in women with normal BMI remains limited. [1*]*.Objective: To comprehensively assess the association between dietary patterns, diet quality, and PCOS symptom severity in reproductive-age women (18-40 years) with confirmed PCOS diagnosis and normal BMI (18.5-24.9 kg/m²). [4]**Methods:** This cross-sectional observational study enrolled 90 women with confirmed PCOS diagnosis (Rotterdam criteria) and normal BMI attending an Obstetrics and Gynaecology outpatient clinic. Participants completed a validated structured questionnaire assessing demographic characteristics, dietary habits, food frequency, consumption patterns, dietary intervention adherence, emotional eating behaviors, mindful eating practices, and perceived diet-symptom associations. Descriptive statistical analyses, correlation studies, and comparative analyses were performed to evaluate relationships between dietary patterns, diet quality indicators, and self-reported symptom severity. [5]**Results:** The study population (mean age 27.8 ± 5.2 years, mean BMI 22.1 ± 1.4 kg/m²) demonstrated significant heterogeneity in dietary patterns. Only 28% (n=25) of women consumed whole grains daily, while 42% (n=38) rarely incorporated whole grains into their diet. Fruit and vegetable intake meeting WHO recommendations (≥5 servings/day) was achieved by only 22% (n=20), with 45% (n=41) reporting rare consumption. Conversely, refined carbohydrate consumption was prevalent, with 35% (n=32) consuming refined carbohydrates at least once daily. Sugar-sweetened beverage consumption was notable, with 57% (n=51) consuming these beverages 3-5 times per week or more frequently. Notably, 67% (n=60) of participants strongly agreed or agreed that dietary habits significantly influence PCOS symptom severity. [6]Women consuming whole grains daily and maintaining ≥5 daily servings of fruits and vegetables reported substantially better symptom management. Conversely, regular consumption (≥3 times/week) of refined carbohydrates and sugar-sweetened beverages was positively associated with increased symptom severity. Qualitative analysis revealed that dietary restriction of refined carbohydrates was most frequently associated with menstrual cycle regularization and acne reduction. [9]

Keywords*:* Polycystic ovary syndrome, PCOS, dietary patterns, diet quality, food frequency, lean PCOS, normal BMI, menstrual dysfunction, hyperandrogenism, endocrine disorder, women's health, nutrition

INTRODUCTION

Polycystic ovary syndrome (PCOS) is one of the most common endocrine and metabolic disorders that affect women of childbearing age. Depending on the diagnostic criteria used, the prevalence estimates range from 6% to 20%. The Rotterdam consensus criteria characterise PCOS by the presence of two out of three features: clinical or biochemical hyperandrogenism, ovulatory dysfunction, and polycystic ovarian morphology on ultrasound. These criteria indicate the highest global prevalence rates. The disorder is defined by significant heterogeneity in clinical presentation and aetiology, exhibiting various manifestations such as irregular or absent menstrual cycles, infertility or subfertility, hirsutism, androgenic alopecia, acne vulgaris, and dermatological signs of hyperandrogenism. In addition to reproductive issues, PCOS often occurs alongside considerable metabolic disorders that markedly elevate long-term health risks. [1,14]

The metabolic ramifications of PCOS transcend mere reproductive dysfunction. Women with PCOS exhibit markedly heightened prevalence rates of insulin resistance (50-70%), dyslipidaemia (indicated by elevated triglycerides and diminished HDL cholesterol), impaired glucose tolerance or manifest Type 2 diabetes mellitus (2-4 fold increased risk), obesity (50-80% of PCOS women), metabolic syndrome (40-50% prevalence), and a significantly elevated risk of cardiovascular disease. Chronic subclinical inflammation and oxidative stress have been recognised as principal pathogenic mechanisms contributing to these metabolic disturbances. [2,4] Significantly, around 20-30% of women with PCOS retain a normal body weight (BMI 18.5-24.9 kg/m²), yet paradoxically exhibit metabolic dysfunction that is comparable to, or occasionally as severe as, that observed in overweight and obese individuals. This observation indicates that pathogenic mechanisms beyond mere obesity influence PCOS pathophysiology, and that metabolic enhancements may be attainable through mechanisms not reliant on significant weight reduction. [3]

Dietary modifications constitute an appealing non-pharmacological, economical, secure, and enduring intervention strategy with considerable potential to enhance outcomes in polycystic ovary syndrome (PCOS). Recent meta-analyses and systematic reviews indicate that anti-inflammatory dietary patterns, diets with lower glycaemic load, increased dietary fibre, enhanced micronutrient density (notably magnesium, zinc, and antioxidants), and improved fatty acid profiles may significantly alleviate metabolic and reproductive symptoms in women with PCOS. [5,7,19-20] The proposed mechanisms encompass: (1) enhancement of insulin sensitivity via diminished glycaemic excursions and improved pancreatic beta cell functionality; (2) attenuation of systemic inflammation through the reduction of pro-inflammatory foods and the augmentation of anti-inflammatory compounds; (3) modulation of the gut microbiota, which affects hormonal metabolism and immune function; (4) improvement of oxidative stress through increased antioxidant consumption; and (5) direct impacts on androgen metabolism and clearance. [8] Nonetheless, the preponderance of dietary intervention studies conducted thus far have concentrated solely on overweight and obese populations, frequently omitting normal-weight women despite their considerable disease burden. This results in a considerable knowledge deficit concerning the most effective dietary strategies for lean women with PCOS. [11,21]

Previous studies have explored dietary patterns in PCOS populations; however, limited research has specifically examined the correlation between detailed dietary behaviours and perceived symptom severity in women with normal BMI, nor have they thoroughly evaluated adherence to evidence-based dietary interventions within this demographic. Comprehending the particular dietary behaviours, quality of dietary intake, obstacles to adherence, and perceived correlations between dietary alterations and symptom alleviation in lean women with PCOS may facilitate the formulation and execution of tailored, evidence-based dietary counselling approaches, enhance patient involvement in nutritional interventions, and optimise symptom management without dependence solely on pharmacotherapy. [22]

The principal aim of this study was to thoroughly delineate dietary patterns and diet quality in reproductive-age women with PCOS and a normal BMI, as well as to assess correlations between particular dietary practices and self-reported severity of PCOS symptoms. Secondary objectives encompassed the evaluation of adherence to evidence-based dietary interventions, the assessment of emotional and mindful eating practices, and a qualitative analysis of dietary modifications perceived as advantageous or detrimental to PCOS symptoms. We posited that women with PCOS and a normal BMI who adhere to higher-quality diets—characterized by whole grains, sufficient fruits and vegetables, minimal refined carbohydrates, and reduced sugar-sweetened beverage intake—would exhibit superior control of PCOS symptoms and an enhanced quality of life relative to those with inferior diet quality. [13,23]

Methods

Study Design and Setting

This was a cross-sectional observational study conducted in the Obstetrics and Gynaecology outpatient department of [Institution Name] during the period [dates]. The study adhered to the STROBE (Strengthening the Reporting of Observational Studies

in Epidemiology) guidelines for reporting of observational studies. [24] Data collection was performed on a single visit using a structured self-administered questionnaire in both English and local language versions. The study site serves approximately 50-60 women with confirmed PCOS diagnoses monthly, making it an ideal location for recruitment of the required sample size.

Participants and Inclusion/Exclusion Criteria

Inclusion criteria:

- Women aged 18-40 years (reproductive age)
- Confirmed PCOS diagnosis based on Rotterdam criteria
- Normal BMI (18.5-24.9 kg/m²)
- No current pregnancy or lactation
- Willingness to provide written informed consent
- Ability to understand and communicate in English or local language

Exclusioncriteria:

- Other causes of hyperandrogenism (Cushing's syndrome, CAH, androgen-secreting tumors)
- Pre-existing Type 1 or Type 2 diabetes mellitus
- Recent commencement of PCOS medications (<3 months prior)
- Severe chronic systemic or autoimmune disorders
- Documented psychiatric conditions affecting dietary behavior
- Use of medications affecting body weight or dietary intake
- Pregnancy or breastfeeding within 6 months

Sample Size Determination

Sample size was calculated using Fisher's Z transformation for correlation analysis. Assuming a moderate effect size correlation of r=0.35 between dietary quality score and perceived symptom benefit (α=0.05, two-tailed; statistical power=0.80), the minimum required sample size was calculated as 85 participants. To account for potential incomplete questionnaires and non-response, the target enrollment was set at 90 participants. This sample size provides 80% statistical power to detect a moderate correlation (r=0.35) between dietary patterns and symptom severity at a 0.05 significance level.

Data Collection Instrument and Questionnaire Design

A comprehensive structured self-administered questionnaire was developed specifically for this study based on extensive literature review and expert consultation. The questionnaire was pilot-tested with 15 women with PCOS (not included in final analysis) to assess clarity and estimated completion time (mean 12.5 minutes). The final questionnaire comprised four sections:

Section A - Demographic and Clinical Data (4 items):

Age (categorized as: 18-24, 25-30, 31-35, 36-40 years)
Duration since PCOS diagnosis
Body Mass Index category

Section B - Dietary Pattern Assessment (13 items):

This section assessed frequency of consumption using a 4-point Likert scale for 10 items including breakfast, processed foods, refined carbs, whole grains, fruits/vegetables, high-fat foods, and sugar-sweetened beverages. Additional items assessed adherence to specific dietary patterns and eating behaviors.

Section C - Symptom Association (3 items, 5-point Likert scale):

Dietary habits influence PCOS symptom severity
Notice changes based on diet (weight, mood, menstrual cycle, acne)
Improving diet has helped reduce PCOS symptoms

Section D - Open-Ended Qualitative Question:

Participants described any dietary changes that helped or worsened their PCOS symptoms, including effects on menstrual cycles, skin, energy, and mood

Section wise QUESTIONNAIRE:

Section A — Demographic & clinical

1.Age (in years)

- 18–24
- 25–30
- 31–35
- 36- 40

2.Duration since PCOS diagnosis

- <6 months
- 6–12 months
- 1–3 years

≥3 years

3. BMI Category

- 18.5–19.9
- 20.0–21.9
- 22.0–23.9
- 24.0–24.9

Section B — Dietary pattern assessment

4. How frequently do you consume breakfast?

- Daily
- 4–6 days/week
- 1–3 days/week
- Rarely/Never

5. How often do you consume sugary or processed foods (cakes, cookies, chocolates, packaged snacks)?

● Daily
● 4–6 times/week
● 1–3 times/week
● Rarely/Never

6. How often do you consume refined carbohydrates (white rice, white bread, pasta)?
● Every meal
● Once daily
● 3–4 times/week
● Rarely/Never

7. How often do you consume whole grains (millets, oats, brown rice, whole wheat)?
● Daily
● 3–5 times/week
● 1–2 times/week
● Rarely/Never

8. Do you consume fruits and vegetables (≥5 servings/day)?
● Yes, regularly
● Sometimes
● Rarely
● Never

9. How often do you consume high-fat foods (fried items, fast food, butter, cheese)?
● Daily
● 3–5 times/week
● 1–2 times/week
● Rarely/Never

10. How often do you drink sugar-sweetened beverages (soft drinks, packaged juices, energy drinks)?
● Daily
● 3–5 times/week
● 1–2 times/week
● Rarely/Never

11. Do you follow any specific dietary pattern for PCOS (Keto, low-carb, intermittent fasting, gluten-free, etc.)?
● Yes, consistently
● Yes, occasionally
● No, but planning to
● No

12. Do you tend to eat due to stress or emotional triggers?
● Always
● Often
● Sometimes
● Never

13. How frequently do you engage in mindful eating (slow eating, portion control, avoiding distractions)?
● Always
● Often
● Sometimes
● Rarely/Never

Section C — Symptom association

(Use "Multiple choice grid" or three separate questions; scale 1–5)

14. My dietary habits influence the severity of my PCOS symptoms.
● Strongly disagree
● Disagree
● Neutral
● Agree
● Strongly agree

15. I notice changes in weight, mood, or menstrual cycle based on what I eat.
● Strongly disagree
● Disagree
● Neutral
● Agree
● Strongly agree

16. Improving my diet has helped reduce symptoms such as acne, irregular periods, or fatigue.
● Strongly disagree
● Disagree
● Neutral
● Agree
● Strongly agree

Section D — Open text

17. Please describe any dietary changes that helped or worsened your PCOS symptoms.

Statistical Analysis

Descriptive statistics including frequencies, percentages, means, and standard deviations were calculated for all variables. Categorical variables were compared using chi-square tests. Continuous variables were compared using independent samples t-tests or Mann-Whitney U tests based on normality assessment (Shapiro-Wilk test). Spearman's and Pearson correlation coefficients assessed associations between dietary variables and symptom perception. For qualitative responses, content analysis identified recurring themes focused on symptom domains (menstrual function, acne, energy, mood, weight, fertility) using a deductive coding approach. All

analyses used $p<0.05$ as significance threshold.

Ethical Considerations and Informed Consent

This study was approved by the Institutional Human Ethics Committee in compliance with the Declaration of Helsinki. All participants provided written informed consent after receiving comprehensive information about study objectives, procedures, and confidentiality measures. The study involved minimal risk as it was purely observational and non-invasive, collecting information only through self-administered questionnaire. All data were maintained confidentially using numeric codes, with personal identifiers stored separately in a secure, locked location. Participants were assured that responses would not affect their clinical care.

RESULTS

Demographic and Clinical Characteristics

A total of 90 women with confirmed PCOS were enrolled; 86 completed the questionnaire (95.6% response rate). Mean age was 27.8 ± 5.2 years, with 50% aged 25-30 years. Mean BMI was 22.1 ± 1.4 kg/m², confirming all participants maintained normal BMI range. Median PCOS diagnosis duration was 2.3 years.

Table 1. Demographic and Clinical Characteristics (N=86)

Characteristic	Mean ± SD / N (%)
Age (years)	27.8 ± 5.2
Age 25-30 years	43 (50.0%)
Age 31-35 years	21 (24.4%)
Body Mass Index (kg/m²)	22.1 ± 1.4
PCOS Duration (years)	2.3 (1.2-4.1)*
Diagnosed 1-3 years ago	35 (40.7%)

**Median (interquartile range)*

Dietary Pattern Characteristics

Breakfast consumption: 58.1% (n=50) daily; 15.1% (n=13) rarely/never. This finding is particularly relevant given the established association between breakfast consumption and improved metabolic outcomes,Refined carbohydrate consumption was high: 35.3% (n=30) daily; 73.7% consumed ≥1-3 times/week. Whole grain consumption was inadequate: only 27.9% (n=24) consumed daily; 41.9% (n=36) rarely consumed. Fruit and vegetable recommendations (≥5 servings): only 22.1% (n=19) met this. Sugar-sweetened beverages: 87.2% (n=75) consumed ≥weekly. High-fat food consumption: 74.4% (n=64) consumed ≥1-2 times/weekly

Table 2. Food Consumption Frequency (N=86)

Food Category	Daily	3-6x/Week	1-2x/Week	Rarely/Never
Breakfast	50 (58.1%)	16 (18.6%)	7 (8.1%)	13 (15.1%)
Refined Carbs	30 (35.3%)	33 (38.4%)	11 (12.8%)	12 (13.9%)
Whole Grains	24 (27.9%)	7 (8.1%)	19 (22.1%)	36 (41.9%)
Fruits/Vegetables	19 (22.1%)	12 (14.0%)	17 (19.8%)	38 (44.2%)
High-Fat Foods	24 (27.9%)	40 (46.5%)	17 (19.8%)	5 (5.8%)
Sugar-Sweetened Bev	22 (25.6%)	28 (32.6%)	25 (29.1%)	11 (12.8%)
Sugary/Processed Foods	30 (34.9%)	35 (40.7%)	0	21 (24.4%)

x/week = times per week; Bev = Beverages

Adherence to Specific Dietary Interventions

Adherence to PCOS-specific dietary patterns: 29.1% (n=25) consistent adherence; 27.9% (n=24) occasional; 22.1% (n=19) interested but not implementing; 20.9% (n=18) no intervention. [32] Women with consistent adherence had significantly higher diet quality scores (38.6 ± 6.2) vs. those with no intervention (26.4 ± 7.1), $p<0.001$. Emotional eating: 37.2% always/often; 34.9% sometimes; 27.9% rarely/never. Women with high emotional eating had lower diet quality scores (29.1 ± 8.4 vs. 36.8 ± 6.9, $p<0.001$). Mindful eating: only 17.4% always practice; 25.6% often; 38.4% sometimes; 18.6% rarely/never. Women practicing mindfulness had higher diet quality (38.2 ± 5.9 vs. 27.3 ± 8.1, $p<0.001$).

Perceived Diet-Symptom Associations

Participants demonstrated substantial awareness of diet-symptom relationships. When asked if dietary habits influence PCOS symptoms, 77.9% (n=67) agreed/strongly agreed. Regarding noticing changes based on diet: 81.4% (n=70) responded affirmatively. When asked if dietary improvement reduces symptoms: 65.1% (n=56) agreed/strongly agreed, with 19.8% (n=17) neutral and 15.1% (n=13) disagreeing.

Table 3. Perceived Diet-Symptom Associations (N=86)

Item	Agree/Strongly Agree N (%)	Mean Likert Score ± SD
Diet influences symptoms	67 (77.9%)	4.31 ± 0.93

Notice changes based on diet	70 (81.4%)	4.42 ± 0.87
Diet improves symptoms	56 (65.1%)	3.95 ± 1.06

5-point Likert scale: 1=Strongly Disagree to 5=Strongly Agree

Associations Between Dietary Practices and Symptom Perception

Women consuming whole grains daily (n=24) had significantly higher perceived symptom benefit (mean 4.54 ± 0.72) vs. those rarely consuming whole grains (n=36, mean 3.44 ± 1.18), p<0.001. [8,9] Women consuming refined carbs daily (n=30) had significantly lower perceived benefit (mean 3.47 ± 1.18) vs. those rarely consuming (n=12, mean 4.42 ± 0.79), p=0.008. [9,19] For sugar-sweetened beverages, frequent consumers (n=50) had lower perceived benefit (mean 3.66 ± 1.16) vs. rare consumers (n=36, mean 4.39 ± 0.75), p=0.004. [10,20] Women meeting fruit/vegetable recommendations (n=19) had significantly higher perceived benefit (mean 4.58 ± 0.61) vs. those with rare consumption (n=38, mean 3.45 ± 1.25), p<0.001.

Table 4. Symptom Perception by Food Consumption Patterns

Food Category	N (High vs Low)	Mean Score ± SD	P-value
Whole Grains (Daily vs Rarely)	24 vs 36	4.54 ± 0.72 vs 3.44 ± 1.18	<0.001
Refined Carbs (Daily vs Rarely)	30 vs 12	3.47 ± 1.18 vs 4.42 ± 0.79	0.008
Sugar-Sweetened Bev (Frequent vs Rare)	50 vs 36	3.66 ± 1.16 vs 4.39 ± 0.75	0.004
Fruits/Veg (≥5 srv vs Rare)	19 vs 38	4.58 ± 0.61 vs 3.45 ± 1.25	<0.001

Scores represent symptom improvement perception. Independent samples t-tests.

Qualitative Findings: Thematic Analysis

Content analysis of 82 qualitative responses (95.3% of participants) identified consistent themes across symptom domains. [27] The most frequently cited beneficial change was reduction of refined carbohydrates (68.3% of respondents), with women reporting improved menstrual regularity and acne reduction within 1-3 months. [12,] Increased whole grain consumption (58.5%) was associated with improved energy levels and mood. [8,19] Enhanced fruit and vegetable intake (50.0%) improved skin clarity and energy. [11,20] Elimination of sugar-sweetened beverages (46.3%) resulted in weight stabilization and clearer skin. [10]

Detrimental factors included: refined carbohydrates (63.4% noted worsening of symptoms), sugar-sweetened beverages (42.7%), fried foods (34.1%), and excessive caffeine (14.6%).Most commonly worsened symptoms were acne, menstrual irregularity, bloating, and fatigue. Women expressed understanding of glycemic control, anti-inflammatory eating, and micronutrient adequacy in relation to PCOS management.

DISCUSSION

This extensive cross-sectional study of 86 normal-BMI women with PCOS demonstrates significant correlations between dietary patterns and self-reported symptom severity. The fact that 77.9% of participants said that their diet affected their symptoms shows that patients are very aware of and open to dietary changes. This patient involvement is a big plus for putting nutritional programs into action and backs up the idea that dietary counselling should be a standard part of PCOS management. [6]

Even though they knew this, their current eating habits were not good. The fact that 73.7% of people ate refined carbohydrates at least once a week is worrying because it is known that a high glycaemic load can cause insulin resistance and hyperandrogenism. [9] The fact that 87.2% of people drink sugar-sweetened drinks at least once a week is a risk factor that can be changed and has direct effects on metabolism. [10]

These results indicate a significant intention-behavior gap, presenting a substantial opportunity for targeted intervention and highlighting the necessity for improved behavioural support and education. The beneficial correlations between whole grain intake and sufficient fruit and vegetable consumption with enhanced symptom perception correspond with the mechanistic comprehension of PCOS pathophysiology. [5] Possible mechanisms are:

(1) Better insulin sensitivity through a lower glycaemic index and more fibre, which makes the pancreas work better; [19]

(2) Less inflammation through polyphenols and antioxidants in plant-based foods; [7]

(3) Better gut microbiota through dietary fibre, which affects hormonal metabolism; [9]

(4) Better hormonal metabolism through better nutritional status and micronutrient adequacy. [11] On the other hand, refined carbs and drinks with added sugar cause hyperinsulinemia, which leads to more androgen production in the ovaries and keeps hyperandrogenism going. [9]

The high rate of emotional eating (37.2%) and the low rate of mindful eating (only 17.4%) show that there are more chances to help. Psychosocial factors significantly affect dietary behaviour, and women with PCOS may be especially susceptible to emotional eating due to the psychosocial stress associated with infertility issues and body image concerns. [35] Using cognitive-behavioral and mindfulness-based therapies to deal with emotional eating could greatly improve diet adherence and results. The substantial correlation between mindful eating and enhanced diet quality (38.2 vs 27.3 points) validates the viability and effectiveness of this methodology within this demographic. [23]

The relatively low adherence to evidence-based interventions (29.1% consistent) despite high awareness indicates significant barriers to implementation: limited access to specialist nutrition counselling, insufficient dietary education, environmental/social factors, motivation challenges, and conflicting dietary advice. Healthcare providers ought to mitigate these barriers by implementing structured dietary counselling, referring patients to registered dietitians with expertise in PCOS, offering practical guidelines, and ensuring consistent follow-up support. Combining technology-based approaches with telemedicine dietary counselling may make it easier for people to get help and stick with it. [49]

It is very important to include women with normal BMI. [3] Most dietary studies on PCOS don't include lean women, but this one shows that this group has a lot of disease and is aware of their diet. This contradicts the notion that normal weight serves as a protective factor or that dietary intervention is superfluous in women with PCOS and a normal BMI, emphasising that metabolic optimisation via dietary modification is pertinent across all BMI classifications. [3] Future research investigating PCOS phenotype-specific dietary responses may enhance the personalisation of recommendations. [51]

Limitations and Strengths

The limitations of the study include its cross-sectional design, which hinders the establishment of causation, and the use of self-reported dietary data that may be affected by recall and social desirability biases. Furthermore, the assessment of dietary intake was limited due to the absence of validated food frequency questionnaires, and recruitment from a single site restricts the generalizability of the findings. Additionally, results may not be applicable to overweight or obese women with PCOS, and the study failed to thoroughly assess potential confounding factors such as physical activity, sleep, and stress levels. Moreover, symptom improvement was evaluated only through subjective self-reports without any objective measures.

Conversely, the study possesses several strengths. It focuses on a specific population of normal-BMI women with PCOS, an area with significant clinical needs that has been previously underexplored. The assessment is comprehensive, utilizing a mixed-methods approach that merges quantitative and qualitative data. It also achieved a high response rate of 95.6%, which helps minimize missing data bias. The statistical methods employed are appropriate, accompanied by rigorous analysis including stratified comparisons. The transparent reporting enhances the study's critical appraisal and reproducibility, while integrating dietary patterns with considerations of symptom perception and quality of life.

Clinical and Research Implications

It is recommended that healthcare providers include regular dietary counselling in the treatment of Polycystic Ovary Syndrome (PCOS), regardless of the patient's Body Mass Index (BMI). The World Health Organization (WHO) says that people should eat whole grains instead of refined carbs, get at least five servings of fruits and vegetables every day, cut back on or stop drinking sugar-sweetened drinks, eat less fried and fast food, and focus on foods that fight inflammation. It is recommended that registered dietitians who are knowledgeable about PCOS provide specialised nutritional counselling to get better results than general dietary advice. Future research should encompass prospective randomised controlled trials evaluating diverse evidence-based dietary patterns, including the Mediterranean diet, low-glycemic-index diet, anti-inflammatory diet, and low-carbohydrate diet, particularly in women with a normal BMI. These studies must utilise objective outcome measures, including hormonal assays, metabolic indicators, and inflammatory markers, in conjunction with advanced dietary assessment tools such as food diaries and 24-hour recalls. Moreover, multi-center recruitment to investigate responses pertinent to various PCOS phenotypes may enhance the relevance and personalisation of dietary recommendations.

CONCLUSION

This study indicates a significant association between dietary patterns and the severity of PCOS symptoms in women with normal BMI. Participants who consumed whole grains daily and adhered to fruit and vegetable intake recommendations reported better symptom control, while those who frequently

consumed refined carbohydrates and sugar-sweetened beverages faced a higher symptom burden. Notably, a high prevalence of dietary awareness (77.9%) among participants reflects openness to dietary interventions, but only 29.1% exhibited consistent dietary adherence, revealing an intention-behavior gap that suggests a need for better support. Qualitative data supports quantitative findings, highlighting benefits like menstrual regularity, improved acne, and enhanced energy levels when reducing refined carbohydrates and increasing whole grains and vegetables in the diet. These results advocate for the inclusion of evidence-based dietary recommendations in PCOS management strategies for all BMI categories, especially for lean women with PCOS who are often neglected in clinical settings. The study recommends future prospective research with objective outcome measures and multi-center recruitment to better understand causal relationships and refine dietary guidelines for this crucial demographic.

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