



# Relationship between eating patterns and emotional distress, and perceived quality of life in women with polycystic ovarian syndrome

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## Abstract

**Introduction and Objective.** Polycystic Ovary Syndrome (PCOS) is a prevalent endocrine disorder with numerous hormonal, metabolic, and reproductive manifestations. Because of the variety of adverse consequences associated with the condition, women with PCOS suffer emotional distress, resulting in reduced health-related quality of life. Similar to other chronic conditions, eating patterns have been shown effective in impacting the quality of life of PCOS patients. Therefore, lifestyle modifications are recommended as a first-line therapy for PCOS, before prescribing any pharmaceutical management of the PCOS. The aim of the study was to investigate the relationship between dietary patterns, emotional distress, and perceived quality of life in women with diagnosed PCOS.

**Materials and method.** The cross-sectional study included 130 women with PCOS aged 18 – 60 years from the Polish population. The respondents were asked to complete a self-administered questionnaire developed for the purpose of the study, inspired by the Food Frequency Questionnaire (FFQ), Polycystic Ovary Syndrome Health-Related Quality of Life Questionnaire (PCOSQ), Three-Factor Eating Questionnaire (TFEQ-R18), and the Eating attitude questionnaire (Eat-26).

**Results.** Respondents were found to experience emotional distress regardless of how healthy their diet. Nonetheless, the results showed that women who followed a healthier eating pattern had lower occurrence of experiencing mood swings, and less often felt triggered in the social context. The group did not show a tendency to over-eat, gain weight, or binge eating.

**Conclusions.** Healthier eating habits, besides providing advantages in weight management, may mitigate symptoms of emotional distress and improve the quality of life in women with PCOS.

## Key words

psychological distress, polycystic ovary syndrome, dietary patterns, health-related life quality, Poland

## INTRODUCTION AND OBJECTIVE

In the developed world, Polycystic Ovary Syndrome (PCOS) has been identified as one of the most prevalent endocrine disorders in women of reproductive age, with an identified as one of the most prevalent endocrine disorders in women of reproductive age, with an estimated global incidence of 6–20% [1]. The syndrome is a heterogeneous condition that exhibits a spectrum of symptoms and affects multiple organ systems. It is characterized as a risk factor for metabolic diseases, such as type 2 diabetes, obesity, insulin resistance and dyslipidaemia, as well as endometrial disorders and ovarian cancer, and is considered the leading cause of infertility associated with ovulatory dysfunction [2, 3]. In addition, PCOS is commonly accompanied by different undesired symptoms that are manifested in appearance, including acne, excess body and facial hair growth, or oiliness of the skin. These symptoms, due to their cultural definition as unfeminine features, have a stigmatizing effect and cause significant impairment of psychological well-being in women [4].

As there is no universal tool used for the appropriate diagnosis of the disorder, the process is based on a combination of clinical and physical examination, as well as basic biochemical tests. As the symptoms of PCOS may be mimicked by multiple other conditions, it is therefore recommended to conduct a thorough evaluation before final determination, and exclude diseases that potentially lead to similar manifestations, such as irregular menstrual periods and increased levels of androgen. Currently, guidelines advise basing the diagnosis of PCOS in adult women on the Rotterdam criteria, which require the presence of two out of three of the following characteristics: clinical and/or biochemical hyperandrogenism, ovulatory dysfunction, or appearance of polycystic ovary morphology [5].

The exact aetiology of PCOS is complex and multigenic, although evidence points to the role of epigenetic and environmental traits in the development of the disease, including diet and lifestyle. The root cause of conditions that comprise the pathology of this disease have not been determined. Nonetheless, the pathogenesis has been strongly associated with dysfunction of luteinizing hormone action and insulin resistance, which is defined as a key feature in the syndrome, contributing to hyperandrogenism and initiating the onset of PCOS [6, 7].

The management of the disease should be symptom-oriented and tailored to the patient's personal needs and

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expectations, as well as prevent the manifestation of long-term complications. The goal of therapeutic approaches is to target the consequences of ovarian dysfunction, mitigate the symptoms of hyperandrogenism, and reduce the risks of correlated metabolic disorders [8]. The treatment involves a combination of lifestyle and medical interventions with the use of metformin, oral contraceptives and/or anti-androgens. Pharmacological treatment is introduced as a second-line therapy and recommended for irregular menstrual cycles, metabolic abnormalities, and hirsutism [9].

Lifestyle alternations are viewed as the initial strategy in all affected women, the modifications should consist of healthier dietary habits, physical activity, maintaining a regular sleep schedule, and behavioural therapy to prevent excess weight gain, and optimize general health [10]. While weight management is acknowledged as a core element of lifestyle interventions, adopting healthier dietary patterns recognizes that a healthy lifestyle provides additional advantages, the occurrence of which is not solely dependent on weight change [11].

In overweight PCOS women, epidemiological studies have shown that reduction in the caloric content of the diet is recommended, aiming for a 30% deficit in the intake which equals approximately 500–750 kcal/day [12]. However, it remains unclear what specific dietary approach provides the greatest favourable effects on the features of PCOS, and the strategies should be implemented according to one's needs and preferences since the systemic responsiveness to weight loss varies between individuals. It has been shown that approaches such as a reduced GI diet, low carbohydrate diet, and Mediterranean diet are all effective for the management of PCOS manifestations. Additionally, certain dietary habits, like having smaller but more frequent meals throughout the day and eating a larger breakfast and smaller dinner, have been demonstrated to display positive effects on insulin sensitivity and androgen reductions [13, 14, 15]. These interventions, besides contributing to weight reduction, improve glucoregulatory status, as well as lipid and hormonal profile, positively effecting the reproductive function in women with PCOS [12].

Among women with PCOS, psychological distress is recorded more frequently than in the healthy population. The mechanisms underlying the association of PCOS with mood disorders are poorly understood. Areas of emotional well-being, such as anxiety and depression, as well as disordered eating, psychosexual dysfunction, and negative body image, have been proven to be strongly related to PCOS [3]. Research shows that women with PCOS are many times more likely, in comparison to other women, to develop moderate to severe anxiety symptoms (as much as six times more likely) and depression symptoms (up to four times more likely) [16]. In addition to the increased odds of developing eating disorders, numerous women diagnosed with PCOS have disordered eating patterns, such as emotional eating, dietary restraint, and episodes of binge eating. In general, individuals with PCOS also report significantly more binge episodes and more frequent episodes of compulsive exercise than healthy subjects. The odds for disordered eating happen to be up to four times higher in women with PCOS, compared to the healthy population, and should be appropriately and systematically screened, assessed, and treated, as they are of particular concern in women of this group [17].

Similarly, hirsutism and obesity have been associated with poor self-perception and negative feelings, including hostility and irritability [12]. General dissatisfaction and frustration with the process of diagnosis, provided information and challenging day-to-day management of the disease also directly impact the health-related quality of life [18]. The feminine identity of women becomes threatened and, in the perspective, PCOS may result in low self-esteem, interpersonal relationship issues, and difficulties in maintaining employment [19].

Hyperandrogenism and hyperinsulinaemia in PCOS are two interrelated factors contributing to weight gain and body dissatisfaction, and further leading to the high prevalence of eating disorders [20]. Since hyperandrogenism recorded in PCOS women persists after the menopausal transition, the vicious cycle of PCOS, eating disorders and obesity can be potentially sustained in the post-reproductive age.

## OBJECTIVE

The aim of the study was to investigate the connection between eating behaviours, health-related quality of life and psycho-social features, such as anxiety, depression, and anger in women with diagnosed polycystic ovary syndrome. Assessment of the relationship between the disease and nutritional attitudes and behaviours in women can contribute towards the advancement of understanding of the complex nature of PCOS. Potentially, it can aid in the development of newer epidemiologic, diagnostic and management approaches, contributing to improved health outcomes and addressing emotional distress and disordered eating behaviours, eventually, contributing to an enhanced quality of life.

## MATERIALS AND METHOD

This cross-sectional study was conducted in Poland between February 2023 – March 2023 among a research group of women with a declared diagnosis of PCOS. Patients were diagnosed for PCOS by a gynaecologist, based on the Rotterdam criteria, and agreed to participate in the study. No patients were selected due to clinical variation. The participants were asked to complete an anonymous self-report questionnaire that consisted of a total of 49 items and had been tested for validity and reliability, which was administrated online on different social media, including Facebook and LinkedIn. The items along with the answers were provided in the Polish language. Individuals interested in participating were provided with accurate information regarding the purpose of study, objectives, benefits, and confidentiality of their data. No written consent was provided by the participants, because by agreeing to complete the questionnaire they simultaneously agreed with the data processing policy and participation in the study. The initial study population consisted of 133 PCOS sufferers who volunteered to participate in the research. The criteria for the inclusion of women in the study were diagnosis of PCOS, age between 18–60 years, body mass index (BMI) over 18 kg/m<sup>2</sup> and command of the Polish language. Post-menopausal women were not excluded from the study. Because of the aim of the study, three subjects who provided incomplete

data were rejected, and the final research group numbered 130 women.

Data was gathered using a questionnaire developed solely for the purpose of the study, inspired by the following tools: the Food Frequency Questionnaire (FFQ) [21], Polycystic Ovary Syndrome Health-Related Quality of Life Questionnaire (PCOSQ) [22], Three-Factor Eating Questionnaire (TFEQ-R18) [23], and the Eating attitude questionnaire (Eat-26) [24]. At the beginning, the questionnaire also included a section concerning anthropometric and socio-demographic characteristics. The cross-cultural translation and adaptation were performed according to the International Society for Pharmacoeconomics and Outcomes Research (ISPOR) guidelines [25] and included direct translation to Polish, back-translation, and the self-reported questions were next validated with a group of 15 Polish women to ensure correct understanding of the questions.

In the section investigating the characteristics of the study population, the survey consisted of questions focusing on lifestyle (incl. general health, eating and dieting habits, sleep patterns) and socio-demographic (marital status, occupation, education, age, height, weight, etc.) information. In this part, respondents could also specify the type of PCOS they were diagnosed with, symptoms they suffer, as well as reporting any coexisting conditions.

In the research, the Food Frequency Questionnaire (FFQ) was used to assess the habitual diet of respondents over the past year, and based on the obtained responses, assign individuals to one of four groups (healthy, less healthy, less unhealthy, unhealthy). The FFQ was an adjusted and shortened version of the EPIC-Norfolk FFQ questionnaire. It was focused on questioning the frequency of daily food intake, type of food and beverage items, sugar and salt consumption patterns, snacking habits, along with cooking technique preferences [21].

Originally, the Polycystic Ovary Syndrome Health-Related Quality of Life Questionnaire (PCOSQ) consisted of 26 questions for assessing people's quality of life in different health-related sub-domains, including emotions (8 questions), hirsutism (5 questions), weight concerns (5 questions), infertility (4 questions), and menstrual disorders (4 questions) [22]. Each item is scored on a 7-point Likert scale, where the optimal function is represented by 7 and the weakest performance is scored as 1. Lower scores were indicative of worse functioning. In this study, the quality of life was measured in 3 domains and focused on issues concerning psychological and emotional status, self-perception and body image, as well as coping. Each item was answered on a 6-point-Linkert-type scale (1 – always, up to 6 – never). The attainable scores were 1–30 for each subscale (Psychological and Emotional Status, Self-perception and Body Image, Coping).

The Three-Factor Eating Questionnaire (TFEQ-R18) is widely used as an eating behaviour, hunger, cognitive restraint, and disinhibition measure. It consists of 18 questions scored on a 4-point Likert scale, with the exception of question 18 which is scored on an 8-point scale. The 3 components of the questionnaire are uncontrolled eating (UE), emotional eating (EE), and cognitive restraint (CR) [23]. A higher score in the area of UE and EE is linked to a tendency to overeat, gaining weight, as well as binge eating. In this study, the questionnaire was adjusted and included 13 questions that were scored on a 5-point-scale (1 – strongly disagree, up to 5 – strongly agree).

Because of an emerged need to rephrase some of the items, another 4 questions were rated on a 6-point Linkert scale (1 – never, up to 6 – always). Question 18 remained the same as in the model questionnaire and scored on an 8-point scale (1 – lack of restraint in eating, complete food restraint). For the UE component, the total score varied from 9 – 47, for the EE subscale, from 3 – 15, and for the CR component, from 6 – 35.

The Eating Attitudes Test (Eat-26) consists of 26 questions on 3 scales of dietary habits, food preoccupation, and oral control. Additionally, the tool includes four behavioural questions that indicate possible eating disorder symptoms. It has been used as a screening tool to identify individuals 'at eating disorder risk'. The assessment is based on feelings, attitudes, and displayed behaviours related to eating and the symptoms of eating disorder. Besides identifying individuals at risk, the tool is also used to monitor progress and outcomes of interventions [24]. In the original test, if the score of an individual is above 20, supplementary examinations and possible treatment should be pursued. Due to differences in scoring answers, in the current study the threshold was proportionally set at 50 points. Also, all the behavioral questions were added in the form of 'Yes/No/Not Given' items, although finally, they were not analyzed. Remaining questions were rated on a 5-point Linkert scale (1 – strongly disagree, up to 5 – strongly agree).

The collected responses were stored on a cloud drive with exclusive access by the author of the study. The data was compiled in Excel and further statistical analyses were performed using Statistica software (version 10).

To describe socio-demographic characteristics, nutritional attitudes and behaviours, as well as quality of life score, variables were compared using descriptive statistical methods, such as mean and standard deviation, as well as frequency (percentage). The relationships between dietary patterns and PCOS-associated quality of life and emotional distress were verified by Spearman correlation.

Participants were divided into 4 groups due to adherence to the general rules of healthy diet and reported nutritional behaviours (healthy, less healthy, less unhealthy, and unhealthy). The responses of the participants in the FFQ as well as the general part of the questionnaire were scored on a maximum scale from 1–6. A higher number always corresponded to a poorer nutritional behaviour or habit. The more points a woman achieved, she was allocated to a group displaying a worse adherence to a generally healthy diet. A group of 31 participants was acknowledged as the 'healthy group' (score: 85–109 points), 38 respondents were identified as the 'less healthy group' (score: 110–119 points), 32 women were recognized as the 'less unhealthy' group (score: 120–129 points), and 29 PCOS sufferers were described as 'unhealthy' (score: 130–168 points). This distribution between individuals eating healthily and those who eat unhealthily was used to assess variables between groups and investigate the relationships between eating patterns, emotional distress and perceived quality of life. Average scores were calculated for each subscale. To determine the level of reliability, understood as the accuracy of the measurement of the questionnaire used, the Cronbach's alpha statistic was calculated for the entire study group. Because of the small size of the sample, a 90% confidence interval was used.



## RESULTS

The women eligible for participation in the study, on average, were  $30.04 \pm 6.93$  years old. Almost 90% (88.46%) of the respondents were aged 21–40, 3.85% of the subjects were aged under 20, and 7.69% were in the age group of 41–60 years. BMI of the participants, on average, scored  $26.66 \pm 6.05 \text{ kg/m}^2$ , which means that 54.62% of the participants were overweight or obese. Regarding waist circumference, the average measurement reported by 93 participants was  $86.46 \pm 17.5 \text{ cm}$ . In questions concerning both comorbidities and symptoms, respondents could choose several answers which are shown as frequencies (Tab. 1).

**Table 1.** General characteristics of the studied group (n=130)

Number of participants	n=130
Age (year) (age range)	18–60
BMI (kg/m <sup>2</sup> ) (BMI range)	18.0–46.7
Smoking (%)	19.3
Level of education (%)	
Elementary education	2.3
Secondary education	26.2
Vocational education	3.1
Higher education – bachelor or engineer	21.5
Higher education – master	46.1
Higher education – doctorate	0.8
Employment status (%)	
Unemployed	10.8
Student	9.2
Home-maker	3.9
Employed part-time	4.6
Employed full-time	71.5
Co-existing conditions (%)	
Mental disorders (e.g., depression, anxiety)	20.8
Eating disorders (e.g., anorexia, bulimia)	6.2
Insulin-resistance	53.8
Endometriosis	10.8
Obesity	32.3
Hypertension	6.9
Hypercholesterolaemia and/or hypertriglyceridaemia	3.1
Functional amenorrhoea of hypothalamic origin (FHA)	7.7
Thyroid diseases – hypothyroidism, hyperthyroidism, Hashimoto	37.7
Type 1 Diabetes	1.5
Type 2 Diabetes	2.3
I have no other diagnosed coexisting conditions	18.5
Reported symptoms (%)	
Hirsutism	46.9
Skin problems (e.g., acne)	51.5
Problems maintaining a healthy body weight	60.8
Chronic fatigue	74.6
Mood changes, irritability	66.9
Abdominal bloating	55.4
Headaches	40.8
Severe menstrual cramps	36.9
Infertility	39.2
Drowsiness	55.4
Menstrual disorders	69.2
Hair loss	71.5
I do not notice any symptoms	1.5

**Quality of life.** In the presented study it was observed that women often suffered from bad moods. Between the group of women following unhealthy dietary patterns and experiencing bad moods, a negative correlation was observed ( $r = -0.153$ ;  $P = 0.083$ ), indicating that they usually happen to experience mood swings more often than women who eat healthier.

Although there was no significant correlation between any specific group, the participants admitted often being overwhelmed by feeling anxious or depressed (mean score:  $3.12 \pm 1.47$ ) ( $r = -0.106$ ;  $p = 0.232$ ). The respondents also indicated that they often feel low self-esteem (mean score:  $3.35 \pm 1.45$ ) and are dissatisfied or embarrassed with some aspects of their appearance (mean score  $3.13 \pm 1.44$ ). The followers of less healthy dietary patterns were also found to experience difficulties in dealing with others, and became irritated easier than women on a healthier diet ( $r = -0.146$ ;  $P = 0.098$ ).

Overall, the participants very often were shown to feel sufficiently supported and accepted by their families (mean score:  $4.69 \pm 1.41$ ), and often did not feel that others were speaking negatively about their appearance (mean score:  $4.42 \pm 1.53$ ). At the same time, the group reported often comparing their appearance with other women who they think are more physically attractive (mean score:  $3.30 \pm 1.70$ ). Data on the quality of life is presented in Tables 2 and 5.

**Nutritional behaviour.** Based on the given responses, the group did not show a tendency to over-eat, gain weight, or binge eat. The average response score to the question in the subscale UE was  $2.60 \pm 1.28$ , for the scale CR it was  $3.26 \pm 1.65$ , while for the dimension EE it scored  $2.89 \pm 1.40$ . These rates place the responses between variants 'Rather not' and 'Hard to say', which provides inconsistent results and prevents identification of more specific characteristics and tendencies in the group. Nonetheless, women on healthier diets were found to experience a greater and more frequent hunger ( $r = 0.298$ ;  $p = 0.00058$ ) (Tab. 3.). At the same time, the groups following less healthy dietary patterns reported having less restraint ( $r = 0.242$ ;  $p = 0.0055$ ) in eating, compared to

**Table 2.** Correlation between reported healthiness of diet and chosen quality of life characteristics (n=130).

Parameter 1	Parameter 2	r	P
Healthiness of diet	Suffering from bad moods	-0.153	$P < 0.09$
	Experiencing difficulties in dealing with others	-0.146	$P < 0.1$
	Feeling like crying for no reason	-0.158	$P < 0.08$
	Feeling like others are speaking negatively about my appearance	-0.155	$P < 0.08$

**Table 3.** Correlation between reported healthiness of diet and chosen Nutritional behaviors (n=130)

Parameter 1	Parameter 2	r	P
Healthiness of diet	Getting so hungry that my stomach often seems like a bottomless pit	0.224	$P < 0.02$
	Being always hungry enough to eat at any time	0.242	$P < 0.006$
	Being with someone who is eating often makes me hungry enough to eat as well	0.248	$P < 0.005$
	Frequency of feeling hungry	0.297	$P < 0.001$

**Table 4.** Correlation between reported healthiness of diet and chosen nutritional attitudes (n=130).

Parameter 1	Parameter 2	r	P
Healthiness of diet	Binge eating	0.168	$P < 0.06$
	Avoiding eating foods with carbohydrates	0.154	$P < 0.08$
	Feeling guilty after eating	-0.287	$P < 0.001$
	Demonstrating self-control in relation to food	0.247	$P < 0.005$

**Table 5.** Mean and standard deviation of scores and subscales of quality of life in nutritional behaviours and attitudes in women diagnosed with PCOS (n=130)

Scales								
Quality of life			Nutritional behaviors			Nutritional attitudes		
Subscale	Mean	SD	Subscale	Mean	SD	Subscale	Mean	SD
Psychological and emotional status	3.48	1.38	CR	19.58	1.65	Dieting	37.68	1.44
Self-perception and body image	3.67	1.60	UE	23.36	1.28	Food preoccupation	13.85	1.37
Coping	4.25	1.66	EE	8.66	1.40	Oral control	15.90	1.29
Total			Total	51.61	4.32	Total	67.43	4.10

UE – uncontrolled eating; EE – emotional eating; CR – cognitive restraint; SD – standard deviation.

**Table 6.** Correlation between reported healthiness of diet, perceived health status and rated healthy status compared (n=130)

Parameter 1	Parameter 2	r	P
Perceived health status	Healthiness of diet	0.122	P < 0.2
	Rated health status compared to others of the same age	0.386	P < 0.001

women on healthier diets. Additional data on the nutritional behaviors are shown on Tables 3 and 5.

**Eating attitudes.** In the study, if the mean rate of an individual was above 50, which according to the scoring system of the tool, meant that an average participant was 'at eating disorder risk', that participant should undertake supplementary examinations and possible treatment. All the women mostly agreed that they were terrified about being overweight (mean score –  $3.93 \pm 1.31$ ). When asked about the feeling of guilt after eating, the group rather did not agree with the statement (mean score –  $2.49 \pm 1.43$ ). However, should that feeling occur, it was found to be associated with the group following less healthy diets ( $r = -0.287$ ;  $p = 0.0009$ ). On the other hand, followers of healthier dietary patterns were shown to demonstrate bigger self-control in relation to food ( $r = 0.247$ ;  $p = 0.0046$ ). Questions concerning bulimia and food preoccupation received low scores. Generally, the group denied displaying these tendencies, scoring on average  $2.82 \pm 1.09$ ,  $1.36 \pm 0.84$  and  $1.45 \pm 1.02$  for 'I find myself preoccupied with food', 'I vomit after I have eaten', and 'I have the impulse to vomit after meals', respectively. More data on Nutritional attitude is presented in Tables 4 and 5.

**Perceived health status.** The relationship of the healthiness of diet and perceived health status of women with PCOS was also examined. Approximately 70% (69.9%) of the respondents declared 'Good' or 'Very good' health status, while the remaining 30% (30.1%) rated their health as 'Bad' or 'Very bad'. No significant correlation was shown between the healthiness of the dietary patterns and perceived health status ( $r = 0.122$ ;  $p = 0.194$ ). Almost 60% (59.4%) believed that their health status is worse than their peers (Tab. 6).

## DISCUSSION

To the best knowledge of the authors, this is the first attempt in Poland to research associations between healthiness of diet, rated based on recorded responses, emotional distress, and perceived quality of life in women with diagnosed PCOS. The areas were researched based on subscales focusing on nutritional behaviours and attitudes, as well as health-related quality of life. The study has proved that there are differences between the intensity of experienced psychological tension of women reporting good dietary practices, and those with less healthy eating patterns.

It was found that an increase in adherence to the general rules of healthy eating had a negative correlation with experiencing troubles dealing with others and becoming irritated with them. Additionally, all women in the study reported dealing with bad moods, as well as often being overwhelmed by feeling anxious or depressed. Previous studies have confirmed that PCOS influences anxiety, depression, and worsen quality of life; therefore, it is crucial to alleviate the symptoms of the disease in order to decrease experienced adverse manifestations. Research has found that adopting healthy dietary patterns influence and improve mood and quality of life in PCOS sufferers [27]. More mindful eating was also effective in reducing symptoms of depression and anxiety [28]. To achieve a more optimal well-being and manage psychological and metabolic features of PCOS or comorbidities, increased physical activity is also fundamental [1].

Although an association has been proven to exist between binge eating and PCOS, no specific etiological link has been found [28]. Binge eating behaviour in women with PCOS is often hard to identify because of the overlapping of symptoms which have a range of manifestations of other diseases.

In the conducted study the results were inconsistent, 2 of the scales covered the issue of disordered eating. Responses in one part of the survey (Eat-26 based) indicated that the group, on average, is 'at eating disorder risk', while results from another part (TFEQ-R18) did not confirm an overall tendency to overeat, gaining weight, or binge eating in the studied group of women. Although the general data do not indicate any predispositions to developing eating disorders in the whole group, there were individual subjects who, based on given responses and obtained scores, were identified with disordered eating behaviours. Other, similar studies, have demonstrated that negative emotions may act as a predisposition for individuals to engage in disordered consumption behaviours in order to regulate emotions [29].

A recent study of polycystic ovary women in Poland revealed that disordered eating behaviours, like binge eating, occur 20 times more frequently comparing to non-PCOS women [30]. It also reported that the states of hyperinsulinism and insulin resistance observed in women with PCOS may be responsible for their experience of increased levels of food cravings. The high rates of presentation of the pathology in this population can be driven by the increased levels of body dissatisfaction, as well as a significant prevalence of psychological disorders, such as mood and anxiety [29]. Additionally, it has been suggested that binge eating and PCOS share some risk factors and etiology, such as common metabolic, mental, and hormonal disorders which may predesignate the both PCOS and binge eating disorders.

**Limitations of the study.** Although the current study has important implications, some limitations were identified. The study was limited by the inclusion of diseases that could potentially affect the quality of data regarding displaying behaviours and mimic symptoms of different syndromes. The division of the studied group was performed based on general rules of healthy diet while, given that only 18% of the respondents were diagnosed with no comorbidities, it is complicated to generalize and propose a unified definition of a 'healthy diet' for a diverse group characterized with a multi-factorial and complicated diagnosis. Additionally, the assessment of diets based on eating behaviours could be performed according to the principles of diet recommended in the treatment of PCOS, because not all characteristics of a generally healthy diet are aligned with the rules of one suitable for addressing PCOS. An improved and standardized questionnaire could be used to collect more adequate data and generate broader understanding of the relationship between the healthiness of diet and reported symptoms of emotional distress and quality of life.

## CONCLUSIONS

The study highlights the potential impact of eating patterns on emotional distress and perceived quality of life in women with Polycystic Ovarian Syndrome. The results suggest that PCOS sufferers who follow a more healthy diet less often experience symptoms of emotional distress, such as inconvenience in social context, changing mood, as well as a lower perceived quality of life. These findings prove the importance of promoting and introducing improved eating habits in interventions in women with PCOS, as healthier lifestyle patterns could be followed as an effective first-line treatment, or integrated in a pharmaceutical therapy for the syndrome. Further research is needed to ensure evidence-based healthcare for women suffering from PCOS.

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