

Nutritional and clinical profile of women with polycystic ovary syndrome



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ABSTRACT

Polycystic ovary syndrome (PCOS) is a complex endocrine disease with heterogeneous clinical signs and symptoms, its main manifestations and clinical consequences being hyperandrogenism, and chronic anovulation, irregular menstrual cycles, presence of multiple cysts in the ovaries and decreased implantation potential embryonic. The aim of this study was to characterize the nutritional and clinical profile of women with Polycystic Ovary Syndrome. The study was carried out virtually using Google Forms from the Google platform, in which the link was made available on social networks. The form contained questions about sociodemographic information, symptoms related to PCOS, presence or absence of chronic noncommunicable diseases, anthropometric data and food consumption using a Food Frequency Questionnaire (FFQ). The participants were 41 women with a mean age of 23.83 ± 4.77 years, with a mean weight, height, BMI and waist circumference of 69.56 ± 17.21 Kg; 1.61 ± 0.06 m; 26.86 ± 7.13 kg/m²; 80.22 ± 12.62 cm; respectively. Most women had depression/anxiety (60.98%) and were overweight/obese (56.10%). The most reported PCOS symptom was menstrual dysfunction (90.24%). There was no statistical significance between the foods consumed and the symptomatology of PCOS ($p > 0.05$). From this study, it is concluded that women with PCOS have a prevalence of overweight and depression and/or anxiety, also showing that the nutritional diagnosis based on the assessment of nutritional status and food consumption is of paramount importance to guide intervention strategies for treating PCOS such as changing lifestyle and eating habits.

Keywords: Polycystic ovary syndrome, Nutrition, Food, Nutritional status, Chronic noncommunicable diseases.

1 INTRODUCTION

Polycystic ovary syndrome (PCOS) is a complex endocrine disease with heterogeneous clinical signs and symptoms, so named due to the frequent presence of enlarged ovaries, with stromal



hypertrophy and multiple cysts in the periphery of the cortex (ZENG et al., 2020). It is estimated that in Brazil, this disorder affects approximately 13% of women of reproductive age (MELO et al., 2012). The manifestations and clinical consequences are: hyperandrogenism, chronic anovulation, irregular menstrual cycles, presence of multiple cysts in the ovaries and decreased potential for embryonic implantation (ALVES et al., 2022).

The pathophysiology of PCOS has not yet been fully clarified, but it is known that the syndrome has a multifactorial etiology that includes intrauterine, genetic and environmental factors that may or may not be interrelated. During pregnancy, several factors, including increased levels of AMH (anti-Müllerian hormone), growth restriction, endocrine disruptors such as BPA (bisphenol A), and excess androgens may predispose to the development of PCOS (SANCHEZ-GARRIDO; TENA-SEMPERE, 2020).

This process may also be associated with various clinical and metabolic disorders that occur at different stages of life depending on the type and duration of an individual's exposure to postnatal environmental factors, for example, exposure to endocrine disruptors, excess androgens, the development of obesity and insulin resistance can be considered pathogenic factors that can also cause PCOS (MELO, et al. 2015; SANCHEZ-GARRIDO; TENA-SEMPERE, 2020).

The diagnosis of the syndrome is made using the following criteria: alteration of menstrual cycles, clinical and/or laboratory hyperandrogenism and polycystic ovarian morphology on ultrasound. In addition, the diagnosis takes into account the exclusion of other causes of menstrual irregularity and hyperandrogenism (SANTOS; ÁLVARES, 2018). The Rotterdam Consensus of 2003 is the most widely used and classifies PCOS by means of four phenotypes: A and B (classical), C (ovulatory) and D (non-hyperandrogenic) (LEGRO et al., 2013; LIZNEVA et al., 2016).

The treatment of PCOS is multifactorial, and there is no single treatment for all patients, as it is closely associated with signs and symptoms, depending mainly on the desired clinical effect (BEDNARSKA; AGNIESZKA, 2017; PEREIRA et al., 2021). Pharmacological treatment uses contraceptive drugs and insulin-sensitizing agents (BRAZIL, 2020; RODRIGUES et al., 2022).

In addition, non-pharmacological treatments such as lifestyle changes, adequate nutrition associated with the practice of physical activity are recommended. It is known that an adequate and varied diet brings benefits to women with PCOS, since these changes in food consumption provide weight loss, reduction of IR, improvement of lipid profile, restoration of ovulation and fertility (TAVARES, 2022). Thus, the objective of this research was to characterize the nutritional and clinical profile of women with Polycystic Ovary Syndrome, in an attempt to make these results an important tool to guide nutritional intervention strategies.



2 METHODOLOGY

A cross-sectional and observational study was conducted. The study was approved by the Human Research Ethics Committee - Centro Integrado de Saúde Amaury de Medeiros (CEP-CISAM), of the University of Pernambuco (UPE), under opinion number 5,665,700. The research followed the norms contained in Resolution No. 466/12 of December 12, 2012 and in Circular Letter No. 1/2021-CONEP/SECNS/MS, which deals with research conducted in a virtual environment.

The study was conducted virtually using Google Forms of the Google platform, in which the link (<https://forms.gle/mdBXbaEBZNTrdRT36>) was made available on social networks, Instagram and WhatsApp. Women who had a clinical diagnosis of Polycystic Ovary Syndrome, older than 18 years, participated in the research by signing a Free and Informed Consent Form (ICF). Pregnant women, those who are in menopause or those who had some cognitive limitation that prevented them from answering the questionnaires were excluded.

Data collection was conducted during the months of December 2022 and January 2023, with participants randomly invited. The form prepared by the researchers exclusively for this study contained initial instructions to guide the completion of sociodemographic information, symptoms related to PCOS (clinical/laboratory hyperandrogenism, polycystic ovaries and changes in the menstrual cycle), presence or absence of chronic non-communicable diseases (diabetes, hypertension, cardiovascular diseases and dyslipidemias), in addition to self-reported anthropometric data (height, weight and circumference of the waist) and food consumption using the Food Frequency Questionnaire (FFQ) based on the food groups of the Food Guide for the Brazilian population (2014).

The Body Mass Index - BMI was calculated using the data of weight (Kg) and the square of height (m), was adopted the classification of the World Health Organization - WHO (2000). Waist circumference is a good predictor of cardiovascular risk, since it is able to reflect intra-abdominal or visceral fat accumulation (NIH, 2000; NHANES, 2007; ROSSI, 2013). The classification used was that of WHO (1998).

The questionnaires were reviewed and categorized for typing. The data were archived, tabulated and processed in the Microsoft Office Excel 2010 program, and presented through tables. Data analysis was performed using descriptive and inferential statistical techniques. The descriptive part consisted of conventional measurements (mean and standard deviation) and frequency tables for sample characterization.

The analysis of the FFQ data was performed based on the methodology proposed by Fornés et al. (2022), in which the general calculation of the frequency of consumption is converted into scores. In order for the frequency of consumption of each item to be treated as a quantitative variable, a weight (S) was assigned to each frequency category through the following equation: $S = (1/30) \times n$, with "n" being the number of times in the month that the individual consumed a certain food. The Mann-



Whitney test was used to evaluate the relationship of median food consumption according to PCOS symptoms. The food consumption score, because it is an ordinal variable, was described as a median. The Spearman correlation test was used to evaluate the correlation between anthropometric measurements and food consumption scores. Data were analyzed using SPSS version 17.0 (Statistical Package for the Social Sciences) and statistical significance was considered when $p < 0.05$.

3 FINDINGS

Participants were 41 women with a mean age of 23.83 ± 4.77 years, with mean weight, height, BMI and waist circumference of 69.56 ± 17.21 kg; 1.61 ± 0.06 m; 26.86 ± 7.13 Kg/m²; 80.22 ± 12.62 cm; respectively. Table 1 presents the data on the socioeconomic and clinical profile of the participants. There was a higher prevalence of brown women (63.41%), with incomplete higher education (36.59%), living in the state of Pernambuco (82.93%) and with a family income of 2 minimum wages (34.15%). Most women had depression/anxiety (60.98%) and were overweight/obese (56.10%). The most reported PCOS symptom was menstrual dysfunction (90.24%).

Table 1. Socioeconomic and clinical profile of women with Polycystic Ovary Syndrome, 2023.

Variables	N (41)	%
Socioeconomic		
Breed identification		
Brown	26	63,41
White	8	19,51
Therefore	4	9,76
Yellow	3	7,32
Schooling		
Incomplete high school	2	4,87
Completed high school	15	36,59
Incomplete higher education	15	36,59
Complete higher education	9	21,95
Origin		
Pernambuco (EP)	34	82,93
Bahia (BA)	6	14,63
Alagoas (AL)	1	2,44
Household income		



< 1 salary	6	14,63
1 salary	10	24,39
2 salaries	14	34,15
3 or more salaries	11	26,83
Clinical		
Depression/Anxiety		
Yes	25	60,98
No	16	39,02
Overweight/Obesity		
Yes	23	56,10
No	18	43,90
Dyslipidemia		
Yes	3	7,32
No	38	92,68
Systemic arterial hypertension (SAH)		
Yes	1	2,44
No	40	97,56
Cardiovascular Diseases (CD)		
Yes	1	2,44
No	40	97,56
Infertility		
Yes	1	2,44
No	40	97,56
Symptoms of PCOS		
Menstrual Dysfunction		
Yes	37	90,24
No	4	9,76
Hiperandrogenismo		
Yes	31	75,61
No	10	24,39
Polycystic Ovaries		



Yes	34	82,93
No	7	17,07

Source: authors, 2023.

Table 2 shows the percentages of the frequency of consumption of different types of food in the last 3 months, which are distributed according to the food groups of the Food Guide for the Brazilian population (2014). Among the group of cereals, breads, pasta and tubers, rice was the most consumed during the week, with a percentage of consumption reported by 52.50% of the participants. Cassava flour was rarely consumed by 32.43% of the women.

In the group of meats, eggs, milk and dairy products, it is possible to observe that 41.03% and 40.00% of the participants consumed cooked meat and egg, respectively, at least twice a week. In the group of oils and fats, a good distribution was verified in relation to the frequency of weekly consumption, highlighting olive oil with a percentage of consumption of two to four times a week of 29.73%. In contrast, 20% of women said they rarely consume oil.

Beans and raw salad were the foods that stood out the most in the group of fruits, vegetables and legumes. The beans being the most consumed weekly by the participants, with a percentage of 38.46%. While 14.64% said they rarely or never consume raw salad. Finally, a consumption of sweets and cakes was reported two to four times a week by 44.74% of the women. At the same time, 39.47% reported consuming sausages once a week.

Table 2. Consumption of different food groups of women with Ovarian Syndrome Polycystic, 2023

Percentage of food consumed (%)								
Food Group	Food	1 time a week	2 or more times a day	2 to 4 times a week	5 to 6 times a week	1 to 3 times a month	Rarely	Never
	Oats	45,95	2,70	18,92	8,11	0,00	24,32	0,00
	Bread	15,00	20,00	35,00	25,00	2,50	2,50	0,00
Cereals, breads, pasta and tubers.	Cookie	27,50	15,00	15,00	15,00	2,50	25,00	0,00
	Macaroni	25,00	15,00	32,50	12,50	5,00	10,00	0,00
	Couscous	17,95	5,13	43,59	28,21	5,13	0,00	0,00
	Cassava Flour	35,14	5,41	10,81	16,22	0,00	32,43	0,00



	Fried meat	20,00	12,50	35,00	12,50	2,50	17,50	0,00
Meat, eggs, milk and dairy products	Cooked meat	17,95	12,82	41,03	17,95	5,13	5,13	0,00
	This	10,00	15,00	40,00	25,00	7,50	2,50	0,00
	Milk and dairy products	5,00	15,00	35,00	35,00	5,00	5,00	0,00
Oils and fats	Oil	20,00	20,00	15,00	20,00	5,00	20,00	0,00
	Margarine	12,50	22,50	25,00	15,00	7,50	17,50	0,00
	Olive oil	24,32	10,81	29,73	10,81	2,70	21,62	0,00
	Fruits	25,00	12,50	40,00	15,00	0,00	7,50	0,00
Fruits, vegetables and legumes	Raw salad	24,39	9,76	41,46	9,76	0,00	12,20	2,44
	Cooked salad	35,14	10,81	29,73	10,81	5,41	8,11	0,00
	Bean	7,62	2,56	46,15	38,46	0,00	5,13	0,00
	Sweets and cakes	23,68	5,26	44,74	13,16	7,89	5,26	0,00
	Frying	28,21	10,26	23,08	12,82	17,95	7,69	0,00
Other	Fast Food	28,95	10,53	10,53	7,89	18,42	23,68	0,00
	Sausages	39,47	5,26	23,68	15,79	7,89	7,89	0,00
	Soft drink	17,50	17,50	27,50	2,50	7,50	27,50	0,00

n = 41. Source: authors, 2023.

Table 3 shows the relationship of the median food consumption according to PCOS symptoms. There was no statistical significance between the food consumed and the PCOS symptomatology ($p > 0.05$). However, it is possible to observe a trend in the relationship of consumption of some foods with the syndrome, such as rice, bread and fried foods with menstrual dysfunction. Hyperandrogenism, on the other hand, showed a tendency to be related to oats, cooked meat, oil, olive oil and cassava flour. Meanwhile, the symptom of polycystic ovary tended to be associated with milk.



Table 3. Comparison between medians (interquartile range) of food consumption scores according to PCOS symptoms of women with Polycystic Ovary Syndrome, 2023.

	Menstrual dysfunction			Hyperandrogenism		Polycystic Ovary			
	Yes	No	p	Yes	No	p	Yes	No	p
Rice	0,72 (0,39 - 0,72)	0,39 (0,10 - 0,64)	0,085	0,72 (0,39 - 0,72)	0,55 (0,39 - 0,72)	0,539	0,72 (0,39 - 0,72)	0,72 (0,39 - 1,00)	0,424
Oats	0,13 (0,00 - 0,39)	0,13 (0,13 - 0,13)	0,924	0,13 (0,00 - 0,13)	0,39 (0,13 - 0,39)	0,059	0,13 (0,00 - 0,39)	0,13 (0,00 - 0,39)	0,546
Bread	0,55 (0,39 - 0,72)	0,26 (0,13 - 0,39)	0,062	0,39 (0,39 - 0,72)	0,39 (0,32 - 1,00)	0,987	0,39 (0,26 - 0,72)	0,72 (0,39 - 0,72)	0,417
Milk	0,72 (0,39 - 0,72)	0,39 (0,39 - 0,85)	0,850	0,72 (0,39 - 0,72)	0,39 (0,26 - 0,72)	0,611	0,39 (0,39 - 0,72)	0,72 (0,39 - 1,00)	0,057
Meat Cooked	0,39 (0,13 - 0,72)	0,39 (0,39 - 0,85)	0,412	0,39 (0,39 - 0,72)	0,13 (0,10 - 0,39)	0,053	0,39 (0,13 - 0,72)	0,39 (0,39 - 0,72)	0,283
Oil	0,39 (0,08 - 0,72)	0,26 (0,08 - 0,64)	0,714	0,55 (0,12 - 1,00)	0,13 (0,05 - 0,39)	0,070	0,39 (0,10 - 0,72)	0,72 (0,00 - 1,00)	0,365
Olive oil	0,13 (0,00 - 0,39)	0,39 (0,20 - 0,39)	0,458	0,13 (0,00 - 0,39)	0,39 (0,26 - 0,72)	0,072	0,13 (0,04 - 0,39)	0,13 (0,00 - 1,00)	0,869
Flour cassava	0,13 (0,00 - 0,39)	0,06 (0,00 - 0,57)	0,645	0,13 (0,00 - 0,20)	0,39 (0,13 - 0,72)	0,064	0,13 (0,00 - 0,39)	0,00 (0,00 - 0,72)	0,774
Frying	0,26 (0,08 - 0,63)	0,10 (0,02 - 0,13)	0,084	0,13 (0,07 - 0,39)	0,13 (0,10 - 0,72)	0,924	0,13 (0,07 - 0,39)	0,39 (0,39 - 1,00)	0,110

Mann-Whitney test. $p < 0.05$. $n = 41$. Source: authors, 2023.

Table 4 shows the correlation between some foods and anthropometric variables of the participants. There was a positive correlation between milk and dairy products and waist circumference ($p=0.041$) and a negative correlation between bread and Body Mass Index ($p=0.006$); and fruits with waist circumference ($p=0.020$). There was no statistically significant difference in the presence of CNCD and food consumption ($p>0.05$, data not shown).



Table 4. Correlation between anthropometric variables and food consumption scores in women with Polycystic Ovary Syndrome, 2023.

Body mass index		Waist circumference		
Foods				
	<i>p</i>	<i>p</i>	<i>p</i>	<i>p</i>
Fruits	-0,246	0,126	-0,483	0,020
Bread	-0,429	0,006	-0,342	0,102
Milk and dairy products	0,195	0,227	0,428	0,041

Spearman correlation. *p* = correlation coefficient. *p* = statistical significance < 0.05. n = 41.

Source: authors, 2023.

4 DISCUSSION

In this study, it is denoted that most of the women diagnosed with polycystic ovary syndrome (PCOS) are young adults, aged between 19 and 36 years, have some degree of overweight and low prevalence of associated comorbidities, such as dyslipidemias, hypertension and cardiovascular diseases. Pontes et al. (2012), found an age profile similar to that of the present study, where the patients had a mean age of 24.9 ± 5.2 years, which indicates that this syndrome is common in women of reproductive age. In addition, the majority self-declared as brown (63.41%), as in the study by Ferreira et al. (2019), in which 71.8% of women also identified with this color.

Geographical factors and ethnic-racial variations can act as possible modulators of the clinical presentation of Polycystic Ovary Syndrome, affecting women of childbearing age, without predilection for races (MOURA et al., 2011; SAINTS; ÁLVARES, 2018).

The study by Machado and Wichoski (2022), reports that 53.09% of the participants were overweight, but 90.12% said they did not have type 2 diabetes mellitus and/or cardiovascular diseases. Despite the results found, the literature shows that PCOS provides women with higher risks of developing obesity, hyperinsulinemia, insulin resistance, type 2 diabetes mellitus and cardiovascular diseases (CALIXTO et al., 2012; Medeiros, 2018). It is known that the first strategy for the treatment of PCOS is lifestyle modification, weight loss linked to regular physical exercise and changes in eating habits. These actions can contribute to the improvement of the symptoms caused by the disease, in addition to preventing chronic non-communicable diseases (CAVALCANTE et al., 2021).

From the analysis of the self-reported weight and height data of the participants, it was verified that 56.1% had Body Mass Index - BMI greater than or equal to 25.0 Kg/m^2 , which according to the World Health Organization (1995), can be classified as overweight and/or obesity. A similar result was found in the study by Campos et al. (2022), where most women with PCOS were classified as obese based on the BMI calculation. Veras et al. (2021), on the other hand, describe that more than 50% of women with this syndrome are overweight and that this excess weight contributes to the aggravation of the symptoms of the syndrome, since in obesity there is a reduction in sex hormone-



binding globulin (SHBG) resulting in an increase in the amount of circulating free testosterone and leading to the typical symptoms of PCOS.

Based on the analysis of clinical variables, an alarming result was obtained regarding the prevalence of women with depression and/or anxiety (60.98%). Solving the real reasons for this number of women with psychiatric manifestations becomes difficult, and this may be a consequence of a primary action of chronically increased sex steroids (androgens), acting at the brain level and altering neurotransmission, or a reaction process to the symptomatic manifestations of the disease, such as hirsutism, menstrual irregularities, infertility and obesity, probably having the influence of both mechanisms (FERREIRA et al., 2006).

Asim, signs and/or symptoms such as hirsutism, infertility or obesity could lead women to express less femininity and different feelings. In addition, the long-term risks of PCOS could also have a negative impact on psychosocial well-being, and the syndrome is associated with feelings of frustration and anxiety (FERREIRA et al., 2006). A similar result was found in the study by Machado and Wichoski (2022), where 66.67% of participants claimed to have depression and/or anxiety related to PCOS.

According to the food consumption data, it was possible to observe that the group of cereals, breads, pasta and tubers was among the most consumed foods weekly by the participants, especially rice with a percentage of 52.50%. A similar finding was obtained in the study by Silva, Rocha and Jota (2020), in which the frequency of daily or weekly consumption of rice was 74.00%. Shishehgar et al. (2016), explain that a high-carbohydrate diet (CHO) leads to hyperinsulinemia and reduction of sex hormone-binding globulin (SHBG), that is, both the quality and quantity of CHO in the diet affect glucose metabolism and insulin sensitivity in PCOS.

In the group of meats, eggs, milk and derivatives, most participants reported consuming these products 2 to 4 times a week. Machado and Wichoski (2022), showed that 91.36% of women with PCOS consume foods of animal origin, especially milk and dairy products with a percentage of 50.62% of daily consumption. The consumption of these products can help in the process of weight loss of patients classified as overweight/obese. Santos et al. (2019), report that high-protein diets are more likely to reduce food intake, increase satiety, and decrease hunger compared to high-carb diets. In addition to improving glucose metabolism and the basal response of β -pancreatic cells, and consequently insulin and blood glucose levels related to androgen production (LIGHT; BUCCHIANICO, 2022).

It was possible to notice that at least 40% of the participants reported a frequency of consumption of 2 to 4 times a week of raw salad, fruits and beans. In the study by Machado and Wichoski (2022), it is observed that 50.62% of women consume fruits and vegetables daily. Ramos et al. (2018), believe that a diet with an optimal consumption of fiber acts on the decrease in the



concentration of estrogens and androgens. In addition, a diet with legumes and, therefore, low glycemic index - GI, acts on the metabolic profile of women with PCOS, with effectiveness in reducing insulin levels, LDL, triglycerides, blood pressure and increased HDL concentration (KAZEMI et al., 2018).

With regard to ultra-processed foods, it is possible to perceive a minimum consumption of at least once a week of this type of product by the participants. These foods have a high caloric value, in addition to being rich in saturated fat, trans fats, sodium, simple sugars and low in nutrients. In the work of Silva, Rocha and Jota (2020), in the group of sweets, the foods that had the highest daily or weekly consumption were sugar (66%), chocolate (45%) and assorted chocolates (30%). According to Tavares (2022), these foods can contribute to the generation of oxidizing agents in the body that are risk factors for the evolution of oxidative stress, in addition to metabolic changes such as insulin resistance, diabetes mellitus, weight gain, dyslipidemias and cardiovascular diseases.

With regard to the relationship between the different types of food and the presence of PCOS symptoms, there was no statistical significance, however, it is possible to observe some positive and negative trends. Rice and bread, for example, are frequent products in the diets of women who have the symptom of menstrual dysfunction, and who have in their composition a predominance of simple carbohydrates, which can lead to an increase in the level of circulating insulin. Dysfunctional insulin in the body causes a decrease in lipolysis (fat breakdown) favoring weight gain, accumulation of abdominal fat and increase in the production of androgens and LH, inserting that the increase in luteinizing hormone hinders its relationship with follicle stimulating hormone (FSH) for normalization of cycles and ovulation (AJMAL; KHAN; SHAIKH, 2019).

Another food that showed a negative trend with menstrual dysfunction was fried foods. It is necessary to emphasize that excess lipids in the diet is a risk factor for cardiovascular diseases, liver diseases and obesity, not only in PCOS carriers, but also in healthy women. Excess fat in the body plays a direct role in the conversion of androgen hormones and in the significant decrease in the production of SHBG, which hinders hormonal normalization and promotes insulin resistance by releasing greater numbers of the hormone Stimulating the production from Androgens and No ovulation (WANDERLEY et al., 2018).

Regarding the symptom of hyperandrogenism there was a positive trend with oats, that is, women who consumed this food in their diet had a lower tendency to present this symptom. Ramos et al. (2018), state that a diet with a higher amount of fiber, it is possible to observe an improvement in insulin sensitivity, as this acts by modulating the glycemic response, improving aspects such as satiety and consequently percentage of body fat.

Another predisposition found was between hyperandrogenism and olive oil. This fact may be due to the presence of omega 3 in this food, a nutrient that has antioxidant and anti-inflammatory properties (SILVA et al., 2022). Polyunsaturated fatty acids improve the action and decrease the



secretion of insulin, also acting in the reduction of testosterone and androgen levels in general (LIGHT; BUCCHIANICO, 2022; SANTOS et al., 2019). In the study of Oner and Muderris (2013), an omega-3 supplementation was performed in women with PCOS with signs of oligomenorrhea, hirsutism, acne and alopecia, the results obtained were the decrease in BMI, insulin levels, serum levels of LH, testosterone (total and free) and androgens, and after 6 months an improvement in hirsutism and IR.

However, women who used oil in their diet had a contrary effect to those who used olive oil, these had a greater tendency to hyperandrogenism. This may be because the high intake of lipids seems to decrease the levels of sex hormone carrier globulin (SHBG), consequently increasing the availability of androgens and estrogens in the target tissue (SANTOS et al., 2019). There was still a negative trend of cooked meat and positive trend of cassava flour with this symptom, but there were no data in the literature to confirm this finding.

For the symptom of polycystic ovaries, the only food that showed a positive trend was milk. In their work Lin and Wu (2015), state that vitamin D and calcium supplementation, in addition to metformin therapy in women with PCOS, can result in beneficial effects on menstrual regularity and ovulation. For Gower et al. (2013), calcium acts in reducing testosterone and androgen levels in general.

With regard to the correlation between diet and anthropometry, waist circumference (WC) showed an inverse relationship with fruit consumption, showing that the greater the presence of fruits in the diets of PCOS carriers, the lower the WC. Fruits because they are rich in micronutrients and fiber, are indicated as protective factors for chronic diseases, for being efficient in reducing inflammation, reducing oxidative stress, helping in weight maintenance in women with PCOS (TAVARES, 2022).

It was also possible to verify that WC has a positive linear relationship with milk consumption, that is, the higher the milk consumption by these women, the greater their measurements. Francisqueti, Nascimento and Corrêa (2015), in their study, state that the high intake of milk and dairy products leads to metabolic inflammation, generated by metabolic cells in response to excess milk proteins and calcium, and these excess nutrients activate inflammatory kinases leading to inhibition of insulin action, which result in a decrease in metabolic rate, which can culminate in weight gain. This result differs from what is found in the study by Santos et al. (2019), where diets with the presence of milk and dairy products were associated with significant weight loss in women with PCOS. The negative correlation between bread consumption and BMI also contradicts findings in the literature, since experimental evidence has indicated that the typical Western diet, which is rich in simple sugars and refined carbohydrates, may favor obesity (SANTOS et al., 2019).

This study contributed to identify the nutritional and clinical profile of women with PCOS, despite having a low number of participants, even so, these findings are significant, as they demonstrate



a trend of association between foods, symptoms and/or anthropometric variables. Thus, nutritional intervention in PCOS is an important strategy for the treatment of this pathology.

5 CONCLUSION

The PCOS patients in this study have a prevalence of overweight and depression and/or anxiety. From the FFQ and the data reported, no statistical significance was obtained in the relation of the characteristic symptoms of PCOS and feeding. However, there was a trend between some foods and these symptoms, which could have been more significant if there had been a larger number of participants.

Therefore, it is concluded that studies on this topic are of paramount importance, and that it is evident that the nutritional diagnosis from the evaluation of nutritional status and food consumption are necessary to guide intervention strategies for the treatment of PCOS, such as changing lifestyle and eating habits.



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