Original Article / Orijinal Araştırma

A Comparison of Eating Attitudes, Diet Quality, and Nutrition Knowledge in Polycystic Ovary Syndrome

Polikistik Over Sendromunda Yeme Tutumu, Diyet Kalitesi ve Beslenme Bilgilerinin Karşılaştırılması

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Abstract

Aim: The purpose of the study was to compare the eating attitude, diet quality, and nutrition knowledge of adult women in Konya according to with and without Polycystic Ovary Syndrome (PCOS).

Material and Method: The study is designed as a survey and the sample consists of 400 adult women in two groups, 80 of whom were diagnosed with PCOS by a medical doctor and 320 were not. The data were obtained using a face-to-face interview with a five parted questionnaire.

Results: The mean scores of EAT-40 of women with and without PCOS diagnosis were 22.2±1.270 and 18.9±0.538, respectively. Women diagnosed with PCOS were more predisposed to eating behavior disorders (p=0.008). The diet quality of both groups was evaluated as poor. The total nutrition knowledge mean score is found 68.4±0.670. According to the regression model, EAT-40 scores and BMI found differed (p=0.000). A positive correlation between DQI-I scores and BMI (p=0.029) and a relation between DQI-I scores and nutrition knowledge (p=0.000).

Conclusion: The results of the study showed that women with PCOS had more eating behavior disorders, and diet quality was poor in both groups. For this reason, women with PCOS should be made aware of eating, diet quality should be increased, and food attitudes and nutrition knowledge should be provided to maintain a healthier life.

Keywords: Polycystic ovary syndrome, eating attitude, diet quality

Öz

Amaç: Araştırmanın amacı Konya'daki erişkin kadınların yeme tutumu, diyet kalitesi ve beslenme bilgilerini Polikistik Over Sendromu (PCOS) olan ve olmayanlara göre karşılaştırmaktır.

Gereç ve Yöntem: Araştırma tarama modelinde tasarlanmış olup, örneklem 80'i tıp doktoru tarafından PKOS tanısı almış ve 320'si almayan olmak üzere iki grup halinde 400 yetişkin kadından oluşmaktadır. Veriler, beş bölümden oluşan anket formu ile yüz yüze görüşme yöntemiyle elde edilmiştir.

Bulgular: PKOS tanısı olan ve olmayan kadınların EAT-40 puan ortalamaları sırasıyla 22,2±1,270 ve 18,9±0,538 bulundu. PKOS tanısı alan kadınlar yeme davranışı bozukluklarına daha yatkın olduğu belirlendi (p=0,008). Her iki grubun diyet kalitesi kötü olarak değerlendirildi. Toplam beslenme bilgi puan ortalaması 68,4±0,670 olarak elde edildi. Regresyon modeline göre EAT-40 puanları ve BKİ'nin, farklılaştığı saptandı (p=0,000). DQI-I puanları ile BKİ (p=0,029) ve DQI-I puanları ile beslenme bilgisi arasında ilişki arasında pozitif korelasyon (p=0,000) belirlendi.

Sonuç: Çalışmanın sonuçları, PKOS'lu kadınların daha fazla yeme davranışı bozukluğuna sahip olduğunu ve her iki grupta da diyet kalitesinin kötü olduğunu gösterdi. Bu nedenle PKOS'lu kadınların daha sağlıklı bir yaşam sürdürmeleri için yeme farkındalıkları ve diyet kalitelerinin artırılması, yeme tutum ve beslenme bilgilerinin sağlanması gerekmektedir.

Anahtar Kelimeler: Polikistik over sendromu, yeme tutumu, diyet kalitesi

INTRODUCTION

Polycystic ovary syndrome (PCOS) is a common endocrine disorder that affects %3-10 premenopausal women. PCOS is characterized by the most common symptom such as ovulatory dysfunction, hyperandrogenemia, and/or polycystic ovaries.[1] In addition to insulin resistance and hyperandrogenism, women with PCOS also have an increase in obesity and visceral adiposity.[2,3] For women with PCOS and overweight, increasing adipose tissue complicates the disease and it becomes more complex, one of them is the tendency to the body weight gaining.[4,5] Initially, lifestyle changes are recommended, including more exercise and proper nutrition. These changes not only result in weight loss, reduced insulin resistance, reduced incidence of type 2 diabetes, and reduced hyperandrogenism, but also increase women's fertility as menstruation improves.[2,6] Nutrition plays a medical role in the prevention and cure of PCOS. Besides the multifactorial etiology of PCOS, typical other PCOS symptoms such as obesity, irregular menstrual periods, hypercholesterolemia, increased blood sugar level, hirsutism, psychological eating behavior disorders, and hormonal imbalance are improved with nutritional treatment.[7,8] Moreover, nutrient adequacies, excessive calorie intake, and fast food consumption played a vital role in coping with the disease.[9,10] In line with all factors, diet quality among nutritional therapy applications is quite high.[11,12] Many studies.[13–15] suggested that overweight women with PCOS-related infertility have poor dietary intake, particularly in terms of whole grains, fiber, and Fe, and eating behaviors inconsistent with achieving a normal body weight.[16] This study aims to determine and compare the eating attitude, diet quality, and nutritional knowledge of adult women according to the diagnosis of PCOS living in Konya, Turkey.

MATERIAL AND METHOD

Model and Sample

The study was designed as a survey model to interact with the relationship between the variables. The study was conducted on two groups of adult women who were diagnosed with PCOS by a gynecologist in the obstetrics and gynecology outpatient clinics of state and private hospitals, and others who were not. In determining the sample size, parameters were entered in the G*Power 3.1.9.2 program as 0.15 for the effect size, 0.05 for the margin of error (α), and 0.95 for the power (1-β). The sample size consists of a total of 400 adult women in two groups, 80 adult women with a diagnosis of PCOS and 320 adult women without a diagnosis of PCOS. Two groups will be compared in terms of the impact power of the study, it is recommended that the other group that is not original should be at least three times higher. Therefore, the group without PCOS was determined to be four times the group with PCOS. The data of the study were obtained between November 2019 and February 2020 in Konya, Turkey. Participants filled and signed the consent form.

Data Collection and Tools

The data were obtained through the questionnaire form using the face-to-face interview method. The questionnaire form consists of 5 parts. Sociodemographic information (e.g., age, gender, diagnosis of PCOS and menopause), anthropometric measurements (e.g., height, body weight), and nutrition habits (e.g., food consumption, diet) existed in the first part. Body weight (kg), and height (m) measurements were taken by the researchers in both groups. An electronic scale (Tanita, Model BC 730) with a sensitivity of ±100 g was used to measure the body weight. Height measurement of women tape measure was used for, without shoes, feet side by side and heels with a portable stadiometer. Body Mass Index (BMI) was calculated kg/m² formula and evaluated by classification prescribed by the Turkish Dietary Guideline (TDG).[17] In the second part, 24-hour dietary recalled record with the consumed food groups and food consumption frequency for use in Diet Quality Index-International (DQI-I) data. Daily intake adequacy in calculated energy and nutrients was evaluated according to the Recommended Dietary Intake (RDI) in TDG.[17] The third part of the questionnaire is the Turkish version of the Eating Attitude Test (EAT-40), which measures healthy eating behaviors and attitudes. EAT-40 consists of 40 items, and it has a 6-point Likert-type scale that determines the responses of always, very often, often, sometimes, rarely, and never. The cut-off point is 30. Items 1, 18, 19, 23, 27, and 39 in EAT-40 are negative items with the answers entered in reverse. In total EAT-40 score, 30 and above reflects a predisposition to eating pathology, and under 30 assessed as normal. In the fourth part, DQI-I was used for assessing diet quality in nutritional transitions. The components of the index are variety, adequacy, moderation, and overall balance. Scores for each component are summed up in each of the four main categories, and scores are added for all four categories. DQI-I evaluation is done as variety (0-20 points), adequacy (0-40 points), moderation (0-30 points), and overall balance (0-10 points) the and total DQI-I score was between 0 and 100 points. In variety score (0-20) determined overall food variety score (0-15) and different protein sources (0-5). As the number of different sources decreases, the score decreases. Adeqconsists-40) consist of vegetable, fruit, grain, fiber, protein, iron, calcium, and vitamin C (each 0-5) of eight parameters and moderation (0-30) is total fat, saturated fat, cholesterol, sodium, and empty calorie foods (each 0-6). Overall balance (0-10) the is the sum of macro nutrient ratio (0-6) and fatty acid ratio (0-4). In total score under 59.9 assessed as poor and 60 and above is good.[18] The last part of the questionnaire was the nutrition knowledge part which made of forty nutrition knowledge questions with 5 multiple choices and each correct question scored 2.5 points and total score ranging from 0 and 100.

Statistical Analysis

The data was analyzed using the SPSS (IBM SPSS for Windows, ver.24) program. Kolmogorov-Smirnov (n>50) and Skewness-Kurtosis tests were used to check whether the continuous measurements to choose parametric and non-parametric tests. Descriptive statistics mean (x̄), standard error of the mean (SE), and number (n) and percentage (%) are used for variables. Independent T-Test and One-Way Analysis of Variance (ANOVA) were used to compare measurements according to PCOS diagnosis. Pearson correlation coefficients and regression analysis were used to determine the relationships between continuous measurements and the relationships were calculated. The Chi-Square test ($\chi 2$) was used to determine the relationship between categorical variables. The statistical significance level (p) criterion was taken 0.05 in all the results.

RESULTS

It was found that the 18-30 age is the highest range of women with and without PCOS diagnosis 55.0% and 57.8%, respectively, and the mean of total populations' age was (x̄±SE) 31.33±10.261 years. The mean BMI of women with PCOS is 26.1 kg/m² and without PCOS is 24.7 kg/m². The mean BMI of those with PCOS was significantly higher (p=0.046). Overweight and obese women with PCOS were 30.0% and 21.2%; and without PCOS diagnosed women were 27.2% and 15.9%, respectively. BMI differed in both groups (p=0.022). The medical history of PCOS was found to be 48.8% and it was differed by PCOS diagnosis (p=0.000). In the PCOS group (n=80), the symptoms of the PCOS were determined menstrual disorder (66.3%), hirsutism (61.3%), fatigue (56.3%), obesity (37.5%), insulin resistance (35.0%), hair loss (32.5%) and infertility (11.7%) in multiple replications. It was determined that the previous diet status of women with and without a diagnosis of PCOS was 57.0% and 41.2%, respectively, and it a differed according to the diagnosis (p=0.012). It was found that the level of consuming 3 main meals in women with and without PCOS was 33.8% and 29.4%, respectively (p=0.496), but the group with PCOS consumed more snacks (3 or more) due to the other (p=0.004).

While the mean EAT-40 score of women with and without PCOS was found 22.2±1.270, and 18.9±0.538, respectively (total score 19.5±0.503), and scores significantly differed (p=0.008). The predisposition of the eating disorder was found 25.0% in the PCOS group and 13.4% in other (p=0.011). Accordingly, **Table 1** represented that a significant difference was observed in terms of EAT-40 scores according to age groups (p=0.014) and BMI (p=0.000) for PCOS diagnosis. The obese group was separated from the others with a high EAT-40 score. On the other hand, as seen in **Table 1**, DQI-I scores for age groups (p=0.105) and BMI (p=0.150) did not differ.

Table 1. EAT-40 and DQI-I Scores of PCOS for BMI and Age Groups (x̄±SE)								
	PCOS Diagnose	n	EAT-40	p	PCOS Diagnose	n	DQI-I	p
Age Group (y)								
	Yes	44	22.0±1.655		Yes	44	50.4±1.539	
18-30	No	185	17.6±0.680		No	185	49.0±0.725	
	Total	229	18.5±0.643a		Total	229	49.3±0.655	
	Yes	23	24.7±2.891		Yes	23	51.0±1.750	
31-40	No	81	18.5±0.952		No	81	47.4±0.994	
	Total	104	19.9±1.003a	0.014	Total	104	48.2±0.873	0.105
	Yes	8	18.0±2.822		Yes	8	50.7±3.797	
41-50	No	31	22.1±1.686		No	31	52.2±1.638	
	Total	39	21.3±1.470ab		Total	39	51.9±1.496	
	Yes	5	19.0±0.927		Yes	5	51.2±07.79	
51-60	No	23	25.5±2.688		No	23	47.6±08.83	
	Total	28	24.4±2.247b		Total	28	48.2±1.631	
BMI								
	Yes	2	19.5±6.500		Yes	2	52.5±7.500	
Underweight	No	30	18.1±1.716		No	30	47.2±1.621	
	Total	32	18.1±1.634a		Total	32	47.5±1.572	
	Yes	37	22.3±1.867		Yes	37	50.6±1.633	
Normal	No	152	16.2±0.676		No	152	48.3±0.826	
	Total	189	17.4±0.676a	0.000	Total	189	48.7±0.738	0.150
	Yes	24	18.7±2.190		Yes	24	49.9±2.016	
Overweight	No	87	20.8±0.961		No	87	49.0±0.943	
	Total	111	20.4±0.889a		Total	111	49.2±0.854	
	Yes	17	27.1±2.784		Yes	17	48.0±2.045	
Obese	No	51	23.8±1.648		No	51	50.2±1.261	
	Total	68	24.6±1.418b		Total	68	51.2±1.068	
a, ab, b :One way ANOVA, Duncan Test								

Women's DQI-I scores evaluated as poor (0-59 points) is %81.8 and good (60-100 points) is 18.2%. and the total average is 49.23±0.477. The difference did not find due to the PCOS diagnosis (p=0.949). Another finding is that the nutrition knowledge mean score (x̄±SE) of women with and without PCOS was 69.1±1.326 and 68.2±0.770, respectively. Age groups did not differ for nutrition knowledge score, on the contrary BMI was not (p=0.004).

When **Table 2** is examined, a significant relationship was found between EAT-40 score and BMI according to the established regression model (p=0.000). When EAT-40 score rose, the BMI was seen to rise. On the other hand, a significant positive correlation between the DQI-I score and BMI (p=0.029). As the DQI-I score increases, a negative relationship is expected to the BMI, while an increase is observed in the BMI. As the DQI-I score increases, BMI is expected to be negatively correlated, but on the contrary, BMI increases. Similarly, a significant relationship was found between the DQI-I score and the nutrition knowledge score (p=0.000). Another regression result represented in **Table 2**, it did not differ between the nutrition knowledge score-BMI (p=0.060), DQI-I score-EAT-40 score (p=0.113) and EAT-40 score and the nutrition knowledge score (p=0.094). Nutritional knowledge scores rise diet quality is also rising.

Table 2. Regression Analysis of EAT-40, DQI-I, and Nutrition Knowledge Scores

Dependent Variable	Independent Variable	SE	β	t	p
EAT-40	BMI	0.088	0.261	5.391	0.000
DQI-I	BMI	0.086	0.109	2.191	0.029
Nutrition Knowledge	BMI	0.121	-0.094	-1.884	0.060
DQI-I	EAT-40	0.047	0.079	1.589	0.113
EAT-40	Nutrition Knowledge	0.037	-0.084	-1.680	0.094
DQI-I	Nutrition Knowledge	0.035	0.196	3.981	0.000

DISCUSSION

In recent years, nutrition-related non-communicable diseases such as obesity have reached epidemic proportions globally. Obesity is also closely related to PCOS, which affects 6-12% of women of reproductive age. PCOS the phenotypic characteristics of women, including hirsutism and oligomenorrhea, can cause great distress by affecting their social and emotional well-being, physical perception, and quality of their life. In our study BMI was related to eating attitudes and diet quality. Wang et al.[6] and Lin et al.[2] stated that BMI differed in both PCOS and non-PCOS groups. Phy et al. found that low starch and low dairy diet improves insulin sensitivity in women with PCOS.[19] Another study.[20] emphasized that diet has a beneficial role in PCOS to decrease anthropometric and metabolic characteristics PCOS. Mediterranean diet and hypertension diet not only reduce PCOS symptoms such as hyperandrogenism but also

good impact on ovarian function.[21] Diet quality may be most complex which compromised settled with the eating attitudes, behavior, and food choices to the treatment of PCOS and its related diseases such as obesity.[12] On the other hand, many studies.[22–24] have suggested that women with PCOS are a higher prevalence of disordered eating attitudes and behaviors as our findings paralleled the studies.[25,26]

CONCLUSION

In summary, BMI was related to PCOS especially in obese women. The EAT-40 mean score of women with PCOS was higher than the mean score of women without PCOS, and they were more prone to eating disorders. Differences were observed in BMI compared to PCOS. Most of the women in the study were rated as poor in diet quality. Although not significantly different, women in PCOS group have higher diet quality. There is no doubt in PCOS treatment diet plays a huge role as can see the results weight management is related to the PCOS treatment and also sustain a well and balanced diet and healthy eating habits. Nutrition knowledge is vital to sustain the diet and lighten PCOS symptoms. Another amazing result is only diet quality is related to nutrition knowledge not others.

ETHICAL DECLARATIONS

REFERENCES

1. Badri-Fariman M, Naeini AA, Mirzaei K, et al. Association between the food security status and dietary patterns with polycystic ovary syndrome (PCOS) in overweight and obese Iranian women: a case-control study. J Ovarian Res 2021;14:134.

2. Lin AW, Lujan ME. Comparison of dietary intake and physical activity between women with and without polycystic ovary syndrome: A Review12. Adv Nutr 2014;5(5):486–96.

3. Orbetzova MM. Clinical impact of insulin resistance in women with polycystic ovary syndrome.[internet] polycystic ovarian syndrome. IntechOpen; 2020. [cited 2022 Jun 2] Available from: https://www.intechopen.com/chapters/undefined/state.item.id

4. Pohlmeier AM, Phy JL, Watkins P, et al. Effect of a low starch/low dairy diet on fat oxidation in overweight and obese women with polycystic ovary syndrome. Appl Physiol Nutr Metab 2014;39(11):1237–44.

5. Ciebiera M, Esfandyari S, Siblini H, et al. Nutrition in gynecological diseases: current perspectives. Nutrients 2021;13(4):1178.

6. Wang Z, Groen H, Cantineau AEP, et al. Dietary intake, eating behavior, physical activity, and quality of life in infertile women with PCOS and obesity compared with Non-PCOS obese controls. Nutrients 2021;13(10):3526.

7. Rojas J, Chávez M, Olivar L, et al. Polycystic ovary syndrome, insulin resistance, and obesity: navigating the pathophysiologic labyrinth. Int J Reprod Med 2014;2014:719050.

8. Rosenfield RL. The Polycystic ovary morphology-polycystic ovary syndrome spectrum. J Pediatr Adolesc Gynecol 2015;28(6):412–9.

9. Hajivandi L, Noroozi M, Mostafavi F, Ekramzadeh M. Food habits in overweight and obese adolescent girls with Polycystic ovary syndrome (PCOS): a qualitative study in Iran. BMC Pediatr 2020; 4;20:277.

10. Thannickal A, Brutocao C, Alsawas M, et al. Eating, sleeping and sexual function disorders in women with polycystic ovary syndrome (PCOS): A systematic review and meta-analysis. Clin Endocrinol (Oxf) 2020;92(4):338–49.

11. Wong JE, Parnell WR, Howe AS, Black KE, Skidmore PM. Development and validation of a food-based diet quality index for New Zealand adolescents. BMC Public Health 2013;8;13(1):562.

12. Gil Á, Martinez de Victoria E, Olza J. Indicators for the evaluation of diet quality. Nutr Hosp 2015; 26;31 Suppl 3:128–44.

13. Turner-McGrievy G, Davidson CR, Billings DL. Dietary intake, eating behaviors, and quality of life in women with polycystic ovary syndrome who are trying to conceive. Hum Fertil (Camb) 2015;18(1):16–21.

14. Xenou M, Gourounti K. Dietary patterns and polycystic ovary syndrome: a systematic review. Maedica (Bucur) 2021;16(3):516–21.

15. Rodino IS, Byrne S, Sanders KA. Disordered eating attitudes and exercise in women undergoing fertility treatment. Aust N Z J Obstet Gynaecol 2016;56(1):82–7.

16. Vaux DL, Fidler F, Cumming G. Replicates and repeats—what is the difference and is it significant? EMBO Rep 2012;13(4):291–6.

17. Turkish Dietary Guideline, TUBER-turkiye-beslenme-rehberipdf.pdf. [Internet] .[cited 2022 Jun 21] Available from: https://dosyasb.saglik.gov.tr/Eklenti/10915,tuber-turkiye-beslenme-rehberipdf.pdf

18. Kim S, Haines PS, Siega-Riz AM, Popkin BM. The diet quality index-international (dqi-i) provides an effective tool for cross-national comparison of diet quality as illustrated by China and the United States. The Journal of Nutrition 2003;133(11):3476–84.

19. Phy JL, Pohlmeier AM, Cooper JA, et al. Low starch/low dairy diet results in successful treatment of obesity and co-morbidities linked to polycystic ovary syndrome (PCOS). J Obes Weight Loss Ther 2015;5(2):259.

20. Shishehgar F, Mirmiran P, Rahmati M, Tohidi M, Ramezani Tehrani F. Does a restricted energy low glycemic index diet have a different effect on overweight women with or without polycystic ovary syndrome? BMC Endocr Disord 2019;19:93.

21. Kazemi M, Jarrett BY, Vanden Brink H, et al. Obesity, Insulin resistance, and hyperandrogenism mediate the link between poor diet quality and ovarian dysmorphology in reproductive-aged women. Nutrients 2020;12(7):1953.

22. Dokras A, Stener-Victorin E, Yildiz BO, et al. Androgen excess- polycystic ovary syndrome society: position statement on depression, anxiety, quality of life, and eating disorders in polycystic ovary syndrome. Fertil Steril 2018;109(5):888–99.

23. Lee I, Cooney LG, Saini S, Sammel MD, Allison KC, Dokras A. Increased odds of disordered eating in polycystic ovary syndrome: a systematic review and meta-analysis. Eat Weight Disord 2019;24(5):787–97.

24. Jeanes YM, Reeves S, Gibson EL, Piggott C, May VA, Hart KH. Binge eating behaviours and food cravings in women with Polycystic Ovary Syndrome. Appetite 2017;109:24–32.

25. Barrea L, Frias-Toral E, Verde L, et al. PCOS and nutritional approaches: differences between lean and obese phenotype. Metabol Open 2021;12:100123.

26. Moran LJ, Ranasinha S, Zoungas S, McNaughton SA, Brown WJ, Teede HJ. The contribution of diet, physical activity and sedentary behaviour to body mass index in women with and without polycystic ovary syndrome. Hum Reprod 2013;28(8):2276–83.