ORIGINAL RESEARCH

Quality of Life and Emotional States of Depression, Anxiety and Stress in Adolescents with Polycystic Ovary Syndrome: A Cross-Sectional Study

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Background: The chronic condition of polycystic ovary syndrome (PCOS) in adolescents can affect different aspects of quality of life in them. This study aimed to determine the correlation between the quality of life with emotional states of depression, anxiety, and stress in adolescents with PCOS.

Methods: This is a cross-sectional study conducted on 120 adolescents with PCOS in Tehran, Iran in 2019. The sociodemographic checklist, quality of life, depression, anxiety and stress (DASS) were assayed by valid and reliable questionnaires. The Pearson's correlation coefficient and linear regression were used for data analysis, which was performed by SPSS (V.22).

Results: The mean (SD) age and menarche age of participants were 16.58 (1.36) and 12.52 (1.19) years, respectively. The most common clinical symptoms of adolescence were irregular menstruation (85%) and acne (61.7%). According to the result of this study, there was a significant reverse correlation between total score of SF-12 with total scores of depression, anxiety and stress (r=−0.395, p=0.001) and a significant reverse correlation was also found between each dimension of DASS scale and 12-Item Short Form Survey (SF-12) (p<0.001). Based on the linear regression model and after controlling the demographic variables, there was a linear regression relationship between total DASS score and SF-12 (Beta= −0.367, p= 0.003).

Conclusion: The study results reveal the role of emotional states of depression, anxiety, and stress in the quality of life of adolescents with PCOS. Based on our findings, we emphasize the interventional studies and guides for improving all dimensions of quality of life and reducing the psychological burden of PCOS in later life of adolescence.

Keywords: polycystic ovary syndrome, quality of life, anxiety, depression, stress

Background

Polycystic ovary syndrome (PCOS) is a worldwide health problem in women of reproductive age.[1,2] This multifaceted disorder may occur in 8–13% of the adolescences.[3,4] Menstrual abnormality, acne and excess hair growth are the most frequent clinical symptoms of PCOS.[5] The long-term sequelae of PCOS include type 2 diabetes, gynecological cancers, infertility and cardiovascular disease.[6] There are different criteria for diagnosing PCOS in adolescence; however, it remains a challenging matter given the lack of consensus on diagnostic criteria among

adolescents.[7] The transition between childhood and adulthood named as adolescence phases, there are different definitions about the age of adolescence.[8] In adolescence phases, the PCOS criteria overlap with normal pubertal development.[9] So, the diagnosis of PCOS in adolescents is difficult than adults.[10]

Self-image is an important factor in the perception of quality of life among adolescents.[11] Women with PCOS have poorer self-esteem and self-image satisfaction because of clinical symptoms such as menstrual irregularities and hirsutism.[12] The quality of life is an essential outcome in chronic diseases,[13] which means the "goodness" of different aspects from everyone's life.[14] Women with PCOS may experience a lower health-related quality of life.[15] Several pieces of evidence suggest the increase of psychological disorders in PCOS females.[16] Females with PCOS may be afflicted with psychiatric disorders or psychosocial concerns.[17] Several studies have reported psychotic disorders in female adults and adolescents who suffer from PCOS.[18,19]

Since more than half of mental disorders in adult period originate from adolescence,[20] it seems that the prevention and early detection of these disorders in adolescence are of high importance. Recently, there have been investigations about quality of life and mental disorders in adult women with PCOS, but there is scarce scientific literature about the relationship between quality of life and psychological aspects in adolescents with PCOS. On the other hand, it appears that different health aspects of adolescence with PCOS differ from adult women with PCOS. Therefore, this study aimed to investigate the following items:

1. Determine the correlation between depression, anxiety and stress with quality of life in adolescents with PCOS and
2. Discover the relationship between PCOS symptom with depression, anxiety and stress in adolescents with PCOS

This study provides useful information for promoting the health and well-being of adolescents with PCOS.

Methods

This cross-sectional study was conducted in health centers affiliated with Shahid Beheshti University of medical sciences in 2019. The study protocol was approved by the Research and Ethics Committee of Shahid Beheshti

University of Medical Sciences, Tehran, Iran [IR.SBMU. RETECH.REC.1397.904]. The sample size of the study was calculated based on the following formula presented by Milsom et al study:[21]

$$n \geq \left[\frac{\left(z_{1-\alpha/2} + z_{1-\beta} \right)}{0.5 \times \ln\left[(1+r)/(1-r) \right]} \right]^2 + 3$$

$$r = 0.30$$
$$\alpha = 0.05 \Rightarrow z_{1-\beta} = 1.28$$
$$N = 112$$

Based on the above formula, the sample size was estimated 112; however, after considering the non-responding subjects, the final sample size was 120 adolescents aged 13–19 years.

Study Population

The inclusion criteria of the study were as follows: female school-going adolescent (aged 13–19 years), polycystic ovary syndrome diagnosed by gynecologist based on Rotterdam criteria (oligoovulation and/or anovulation, hyperandrogenism, polycystic ovaries[22]), no history of chronic disease, voluntary participation in the study. The exclusion criteria were participants with previous mental illness through self-report on history, psychiatric diagnoses, consumption of psychiatric medications and having diseases, such as non-classic congenital adrenal hyperplasia, thyroid dysfunction, hyperprolactinemia, etc., based on international evidence-based guideline.[23] The participants were recruited from health centers and gynecological clinics of Shahid Beheshti University of medical sciences and those who did not consent to take part in this study were excluded. In this study after explanation, the objectives of study the written informed consent obtained from the adolescents and their parent or legal guardian. The participants over the age of 18 years provided written informed consent, and that this study was conducted in accordance with the Declaration of Helsinki.

Assessment

The assessment questionnaire included the following items:

1. A checklist related to demographic features and medical history (age, weight, height, body mass index, menarche age, menstrual regularity, parent education, family income, place of living, and medical history),

and the data were collected by the recall and interview with adolescence and their parents.

2. Depression Anxiety Stress Scales-21 (DASS-21). This tool is a self-report scale with three domains (depression, anxiety, stress), each of which includes 7 items.[24] DASS-21 was scored based on 4-point Likert scale (0–3). The final score of each domain (depression, anxiety, and stress) was multiplied by 2. The range of stress domain was normal: 0–10, mild: 11–18, moderate: 19–26, severe: 27–34, and extremely severe: 35–42). The range of anxiety domain was as follows: normal: 0–6, mild: 7–9, moderate: 10–14, severe: 15–19, extremely severe: 20–42) and the range of depression domain was normal: 0–9, mild: 10–12, moderate: 13–20, severe: 21–27, and extremely severe: 28–42). The total score of DASS was calculated by summing up the items of each domain. Asghari et al study confirmed the validity and reliability of the Persian version of Depression Anxiety Stress Scales-21 (DASS-21) in Iranian people.[25] In our study, the test re-test was done on 10 adolescents with PCOS.

3. Twelve-item Short-Form Health Survey (SF-12): This short-form scale provides us with summary information on the status of mental and physical health of each person.[26] It measures the physical health-related domains such as General Health (GH), Physical Functioning (PF), Role Physical (RP), and Body Pain (BP). Mental health-related scales include Vitality (VT), Social Functioning (SF), Role Emotional (RE) and Mental Health (MH). Montazeri et al confirmed the validity and reliability of the Persian version of the 12-item Short-Form Health Survey among the Iranian population.[27] In this scale, the 37–48 score range demonstrates a good quality of life; 25–36 shows a moderate quality of life; and 12–24 a poor quality of life.

Statistical Analysis

The analysis of data was performed in IBM SPSS version 17. The quantitative variables were described with a mean (SD) and qualitative variables were defined by frequency (%). Kolmogorov–Smirnov test was used for evaluating the normality of variables. Pearson's correlation coefficient was employed to calculate the correlation between DASS score and SF-12 score. In the linear regression model, SF-12 was the dependent factor and DASS and sociodemographic factors were considered as intended factors. The significance level was considered to be less than 0.05.

Results

One hundred and twenty adolescents aged 13–19 years with PCOS participated in this study. The mean age and menarche age of participants were 16.58 and 12.52 years, respectively. Table 1 shows the demographic characteristics of the participants. The mean (SD) of total DASS score was 44.2 (21.4), the depression 12.88 (9.15), anxiety 12.73 (7.92), and the stress 18.58 (8.72) with total SF-12 score of 33.68 (4.71).

The most common clinical symptom of adolescence was irregular menstruation (85%) and the most frequent complaint site of acne was the right cheek (44.8%). The characteristics of clinical symptoms are indicated in Table 2. According to the results of this study, there was a significant reverse correlation between total score of SF-12 with total score of depression, anxiety and stress (r= –0.395, p=0.001) and a significant reverse correlation was found between each dimension of DASS scale and SF-12 (p<0.001). (Table 3). In this research, there was no significant difference between PCOS symptoms with depression, anxiety and stress (p>0.05).

According to the linear regression model, after controlling for demographic variables, there was a linear regression relationship between total DASS score and SF-12 (Beta=−0.367, p=0.003) (Table 4).

Table 1 Demographic Characteristics of Study Participants

Variable		N (%) or Mean (SD)
Age (year) Menarche age (year) Body mass index (kg/m²)		16.58 (1.36) 12.52(1.19) 25.13(4.13)
Location	Urban Rural	106 (88.3%) 14 (11.7%)
Father education	Primary High Diploma Academic	2 (1.7%)) 10 (8.3%) 58 (48.3%) 26 (28.7%)
Mother education	Primary High Diploma Academic	2 (1.7%) 13 (10.8%) 42 (35.8%) 40 (33.3%)
Family income	Good Moderate Poor	34 (28.3%) 74 (61.7%) 7 (5.8%)

Table 2 The Frequency of Clinical Symptoms in Participants

Variable	N (%)
Irregular menstrual	99 (85.3%)
Hair loss	69 (59%)
Hirsutism	61(52.1%)
Acne	71 (61.7%)
Forehead acne	43 (41%)
Right cheek acne	47 (44.8%)
Left cheek	43 (41%)
Nose	17 (16.2%)
Chine	35 (33.3%)
Chest and upper back	42 (40%)

Table 3 Pearson Correlation Coefficient Matrix of the Measured Variables

Variable	Total. DASS	Depression	Anxiety	Stress
Total.SF-12	r= −0.39 P= 0.001	r= −0.042 P= 0.001	r= −0.22 P= 0.012	r= −0.31 P= 0.001
Physical health-related domains	r= −0.20 P= 0.02	r= −0.23 P= 0.009	r= −0.19 P= 0.031	r= −0.07 P= 0.4
Mental health domains	r= −0.40 P= 0.001	r= −0.42 P= 0.001	r= −0.1 P= 0.05	r= −0.38 P= 0.001

Table 4 The Linear Regression Model of Quality of Life

Variable	B	Std. Error	Beta	t	p-value
Menarche age	0.558	0.491	0.13	1.13	0.20
BMI	−0.088	0.135	−0.08	−0.65	0.515
Mother education	1.227	1.026	0.16	1.19	0.237
Father education	−0.813	0.957	−0.12	−0.85	0.399
Total DASS	−0.076	0.025	−0.36	−3.06	0.003

Discussion

In this study, we assessed the relationship between quality of life with emotional states of depression, anxiety, and stress in adolescents with polycystic ovary syndrome.

Our research demonstrates that 85% of the adolescents experience irregular menstrual cycle, 61.7% have acne and 59% suffer from hair loss. Interestingly, in this study, there was no significant difference between PCOS symptoms with depression, anxiety and stress.

Nevertheless, the result of a study on adult Iranian women with PCOS showed a significant relationship between PCOS symptom and depression.[28] It seems that the physiological changes due to puberty overlap with PCOS symptoms during adolescence period;[29] therefore, a number of symptoms attributed to PCOS may be a function of the normal process of puberty. In this regard, Rahebi et al (2015) reported that the age is a predictor of depression in women with PCOS.[30] On the other hand, in adults with PCOS, the infertility and stress of future life without a child are a psychological factor menacing their health.[31] Barry et al (2011) in a meta-analysis revealed that women with PCOS reported higher depression and anxiety scores.[32] The result of the Australian Longitudinal Study of Women's Health showed that the prevalence of mental health problems (ie, depression, anxiety and stress) was higher in women with PCOS than those without it.[33] It appears that the parents and health-care providers should provide more emotional and social support for the adolescents with PCOS because of psychological aspects of this disease.

According to the findings of this study, there was a significant reverse correlation between the total score of SF-12 and that of depression, anxiety and stress score. The correlation between quality of life with depression, anxiety and stress has been reported in previous studies in adult women with PCOS. Likewise, Chaudhari et al (2018) reported that women aged 18–45 years with PCOS experience 38% anxiety and 25% depression and that these psychological factors have a negative correlation with the quality of life.[34] Consistent with our study, Trent et al (2001) research on adolescents aged 13–22 years showed that PCOS negatively affected quality of life of adolescents.[35] Nevertheless, the result of a study on 28 Turkish adolescents with PCOS and 31 healthy peers indicated that the Pediatric Quality of Life Inventory score was not significant between the two groups.[36] Surprisingly, the findings of a pilot study on 37 adolescents with PCOS revealed that there is no significant correlation between anxiety and depressive state in both groups of adolescents with and without PCOS.[19] In Yoldemir et al (2017) study, menstrual problems were the worst factor affecting the quality of life in women with PCOS.[37] The experience of PCOS women reveals that the discomfort related to menstrual abnormality should be considered as a part of patient-reported outcome measures.[38] Depression in adolescence period is a threat throughout the developmental phases of adolescence life.[39]

Chronic disorders in adolescence can disrupt the quality of life aspects, which involves them with different concerns and challenges.[40] The health-related quality of life is affected by psychological and physical health factors.[20] It seems that the quality of life of adolescents with PCOS in our study was influenced by various psychological and physical health factors.

Difficulty in the diagnosis of PCOS in adolescence and lack of agreement on diagnosis criteria[41] that lead to delayed diagnosis of PCOS cause dissatisfaction in patients.[42] It appears that late diagnosis and facing with different challenges of PCOS symptoms can threaten the quality of life and mental health of females.

Finally, the current findings suggested the need for a comprehensive assessment of quality of life in adolescents with a disease-specific questionnaire. Based on our findings, we emphasize the interventional studies and guidelines for improving all dimensions of quality of life and reducing the psychological burden of PCOS in later life of adolescents. Investment on adolescent health can guarantee their future life as well as public health.

The symptoms of PCOS may affect the physiological aspects of adolescents afflicted with PCOS, after which different aspects of quality of life are influenced. An implication of the findings of this study is to regard psychological and mental issues as well as emotional support of adolescents with polycystic ovary syndrome and training their parents to help them. Based on the International evidence-based guideline for the assessment and management of PCOS (2018) should be screened for depressive and anxiety symptoms.[23] It is likewise essential to plan psychological consultation of adolescences, especially in coping with PCOS.

Limitation

Because of cross-sectional design of our study, it was not possible to estimate the causal relationship between depression, anxiety and stress with SF-12 form. Previous studies have used different instruments for assessing the relationship between quality of life and its aspects[43] with depression, anxiety and stress, which is a limitation restricting the comparison of our findings with previous studies. Moreover, given the lack of a disease-specific questionnaire about PCOS in adolescents, we suggest future studies about disease-specific quality of life questionnaires in adolescents with PCOS.

Conclusion

These study results reveal the role of emotional states of depression, anxiety, and stress in the quality of life of adolescents with PCOS. Based on our findings, we emphasize the interventional research and directives for improving all dimensions of quality of life and diminishing the psychological burden of PCOS in later life of adolescents.

Abbreviations

PCOS, polycystic ovary syndrome; DASS, depression, anxiety and stress; SF-12: 12-Item Short Form Survey (SF-12).

Disclosure

The authors report no conflicts of interest in this study.

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