



Relationship Between Health-Promoting Lifestyle and Quality of Life in Women With Polycystic Ovarian Syndrome

Mojgan Mirghafourvand¹, Sakineh Mohammad-Alizadeh Charandabi², Tahereh Behroozi Lak³, Fatemeh Aliasghari^{4*}

Abstract

Objectives: Promoting the quality of life in women with polycystic ovarian syndrome (PCOS) is one of the most important goals of the medical community and the importance of lifestyle is more apparent in this area. This study aimed to determine the relationship between health-promoting lifestyle and quality of life in women with PCOS.

Materials and Methods: This study was conducted on 174 women with PCOS who attended public and private fertility clinics in Urmia (west Azerbaijan, Iran). The participants were selected by convenience sampling method. The data were collected through socio-demographic, health-promoting lifestyle (HPLP-II) and quality of life (PCOSQ) questionnaires. Multivariate linear regression was used to determine the relationship between the independent variables (health-promoting lifestyle and socio-demographic characteristics) and the dependent variable (quality of life).

Results: The mean (standard deviation) of total score of the quality of life was obtained 45.8 (11.3) in the range between 0 to 100. The highest and lowest mean scores were in the sub-domains of weight and hirsutism. The mean (SD) of total score of health-promoting lifestyle was 2.2 (0.3) out of 4. Based on multivariate linear regression, the variables of health responsibility, stress management, spiritual growth, body mass index (BMI), woman's job and menstrual cycle intervals were predictors of the quality of life in women with PCOS.

Conclusion: Given the importance of lifestyle in women with PCOS to maintain and improve their quality of life, it is necessary to take serious strategies for changing and improving their lifestyle.

Keywords: Health-promotion, Lifestyle, Polycystic Ovarian syndrome, Quality of life, Women

Introduction

Polycystic ovarian syndrome (PCOS) is one of the most common endocrine disorders (1) with multiple reproductive, hormonal and metabolic complexities determined as ovarian dysfunction and clinical or biochemical symptoms of hyperandrogenism and sonographic appearance of polycystic ovaries (2). Women with PCOS are at high risk of fertility problems, such as infertility, endometrial cancer, late menopause (3), and also metabolic disorders, such as dyslipidemia, type 2 diabetes mellitus and cardiovascular diseases (4). The main cause of this disorder is still unknown and researchers believe that there is no cure for this syndrome and available treatments just aim to improve its symptoms (5).

Quality of life is based on the perception of life and is quite subjective (6) as well as it is a multidimensional concept including physical, psychological and social aspects of health (7). According to the World Health Organization (WHO), 60% of individual's quality of life depends on their attitude and lifestyle (8).

Health-promoting lifestyle includes behaviors that enable people to increase their control over their health and ultimately to improve their own and the society's health (9,10). Health-promoting lifestyle is the foundation of long-lasting health (11). Since promoting the quality of life in women with PCOS is one of the most important goals of the medical community, the importance of lifestyle is more apparent in this area (12). A study by Clark et al on women with PCOS was conducted on the effect of lifestyle modification. The results showed that interventions improved the quality of life (13). Thomson et al studied lifestyle and quality of life in women with PCOS and reported that limiting energy to moderate level improves the quality of life, while doing exercise without proper diet has no greater benefits (14). Lifestyle modification is suggested as the first-line PCOS treatment (15). It has been reported that using appropriate lifestyle in women with PCOS has improved 75% of problems (16).

Given that most patients are young women and that many factors can affect various aspects of their lives,

Received 8 December 2016, Accepted 8 March 2017, Available online 25 March 2017

¹Department of Midwifery, Tabriz University of Medical Sciences, Tabriz, Iran. ²Social Determinants of Health Research Center, Tabriz University of Medical Sciences, Tabriz, Iran. ³Reproductive Health Research Center, Urmia University of Medical Sciences, Urmia, Iran. ⁴Students' Research Committee, Nursing and Midwifery Faculty, Aras International Branch, Tabriz University of Medical Sciences, Tabriz, Iran.

*Corresponding Author: Fatemeh Aliasghari, Tel: +989906124003, Email: mid2014.tabriz@gmail.com



it is necessary to modify lifestyle, maintain health and improve the quality of life in these women. Furthermore, no study has been conducted on the relationship between health-promoting lifestyle and quality of life in Iranian women with PCOS; therefore, we decided to evaluate the relationship between quality of life and health-promoting lifestyle in these women to take effective steps in improving their lifestyle and quality of life.

Materials and Methods

Study Population

This cross-sectional study was conducted on 174 women with PCOS who attended public and private fertility clinics in Urmia (capital of west Azerbaijan province, Iran) in 2015. The participants were selected according to the physician's final diagnosis of PCOS.

Inclusion criteria included diagnosis of PCOS based on medical records, willingness to participate in the study, being in reproductive age and having secondary school education and higher. Exclusion criteria included suffering from physical or mental diseases leading to limitations in health-promoting lifestyle, such as experiencing grief or other life events during the last three months, having special diets and having a history of depression.

Sampling

Sampling was performed in 2 private and 2 public centers in Urmia. Since convenience sampling was used, the researcher attended the mentioned centers and evaluated all the women who referred to the centers for various reasons such as amenorrhea, oligomenorrhea, hirsutism, ultrasound results indicating ovarian cysts, acne, infertility and so on. The participants were enrolled according to their medical record and the physician's final diagnosis of PCOS. Women who were willing to participate in the study were assessed in terms of eligibility criteria and if they were eligible, they signed the informed consent and were assured of confidentiality of all the information. Finally, they completed the questionnaires.

Measures

The data collection tools included socio-demographic and obstetrics, Health-Promoting Lifestyle Profile-II (HPLP-II), and Polycystic Ovarian Syndrome Quality of Life (PCOSQ) questionnaires (see Supplementary file).

HPLP-II consists of 52 items containing 6 dimensions of health-promoting behaviors related to nutrition, physical activity, spiritual growth, health responsibility, stress management and interpersonal relationships. All items were scored based on Likert scale ranging from 1 to 4 (1 = never, 2 = sometimes, 3 = frequently, 4 = always) (17). Higher scores indicate higher health-promoting behaviors. Persian version of this tool was used in a study on women of reproductive age and Cronbach α and the intra-class correlation coefficient (ICC) have been reported 0.9 and 0.89, respectively (18).

PCOSQ includes 26 items containing dimensions of emotions, hirsutism, weight, infertility and menstrual disorders. All items were scored based on Likert scale ranging from 1 (strongly/all of the time) to 7 (no problems/never) (19). Higher scores indicate better quality of life. Validity and reliability of the Persian version of questionnaire was confirmed by Amini et al (20).

The reliability of the HPLP-II and PCOSQ was determined by repeating the test-retest with a 2-week interval on 20 women with PCOS through using the ICC assessment. The ICC was 0.96 for HPLP-II and 0.99 for PCOSQ.

Sample Size and Statistical Methods

Based on the parameter of quality of life and according to the results of the study by Amini et al (21), the sample size was calculated as 146 individuals (mean = 48.13, standard deviation [SD] = 29.69, precision around the mean = 0.1, α = 95%, and power = 90%). Considering the 20% sample loss, the final sample size was calculated as 174 individuals.

Statistical analysis was performed in SPSS version 21.0 software. Normality of the quantitative data was confirmed by Skewness and Kurtosis. Descriptive statistics including frequency and mean (SD) were used to describe socio-demographic characteristics, quality of life and health-promoting lifestyle. Pearson correlation coefficient was used to determine the relationship between health-promoting lifestyle and quality of life, and independent *t* test and one-way analysis of variance (ANOVA) were used to determine the relationship between socio-demographic characteristics and quality of life, then all variables with $P < 0.2$ based on bivariate analysis (Pearson correlation coefficient, independent *t* test and one-way ANOVA) were entered into backward multivariate linear regression model to estimate the effect of each independent variables (health-promoting lifestyle and socio-demographic and obstetrics characteristics) on the dependent variable (quality of life) and to explain the variance.

Results

The socio-demographic and obstetric characteristics of participants were reported in Table 1. The mean (SD) score of the quality of life was 45.8 (11.3) out of 100. The highest and lowest mean scores were obtained for weight (52.2 [30.6]) and hirsutism (37.7 [18.1]), respectively. The mean (SD) of total score of health-promoting lifestyle was obtained 2.2 (0.3) out of 4. Women obtained the highest mean score in nutrition (2.9 [0.5]) and the lowest mean score in stress (1.2 [0.5]). There was a statistically significant positive correlation between quality of life and total score of health-promoting lifestyle ($r = 0.3$; $P < 0.001$) and all of its subdomains (except stress management) ($r = 0.2$ to 0.3 , $P < 0.05$) (Table 2).

In this study, body mass index (BMI), the first supporter, and menstrual cycle intervals showed a statistically significant relationship with quality of life ($P < 0.05$) (Table

Table 1. The Relationship Between Socio-Demographic and Obstetrics Characteristics and Quality of Life in Women With PCOS Referred to Public and Private Clinics for Infertility in Urmia (n = 174)

Variable	Number	Mean (SD*)	P Value
Body Mass Index (kg/m²)			0.001
18.5 - 24.9	43	54.4 (10.9)	
25 - 29.9	54	46.8 (11.1)	
≥ 30	77	40.2 (8.2)	
Ethnicity			0.194
Azeri	99	46.2 (11.3)	
Kurd	62	46.3 (11.7)	
Persian	13	40.3 (9.2)	
Place of residence			0.663
City	139	45.6 (11.4)	
Village	35	46.5 (11.3)	
Marital status			0.005
Single	40	42.4 (7)	
Married [†]	134	46.8 (12.2)	
Having children			0.749
Yes	53	46.3 (10.8)	
No	81	47 (13.1)	
Spouse's education			0.226
Secondary school and lower	39	48.5 (13.5)	
Diploma	58	44.6 (9.3)	
University	37	47.5 (12.3)	
Mean length of menstruation			0.295
< 3 Days	40	43.7 (7.8)	
3 – 7 Days	108	46.8 (12.3)	
> 7 Days	26	44.6 (11.9)	
Mean interval between two consecutive menstruation			0.001
< 21 Days	22	45.6 (11.3)	
21 – 35 Days	48	51.6 (11.4)	
> 35 Days	104	43.1 (10.4)	
Amount of bleeding in menstruation			0.758
Slight	46	45.3 (8.9)	
Average	86	45.9 (13.4)	
Severe	28	47.3 (8.7)	
Very severe	14	43.4 (10.4)	
Spouse's job			0.514
Working [‡]	40	45.9 (12.4)	
Employee	26	48.4 (10.3)	
Shopkeeper	31	48.2 (10.1)	
Other**	37	44.7 (12.6)	
Women's education			0.354
Middle school	28	47.9 (12.5)	
Diploma	97	44.7 (11)	
Collegiate	49	46.6 (11.3)	
Women's job			0.139
Housewife	109	46.7 (12.7)	
Employee	65	44.3 (8.5)	
Adequacy of monthly income for living expenses			0.742
Not at all	54	46.4 (11.1)	
Somewhat	94	45.8 (11.8)	
Completely	26	44.3 (10.5)	
The role of perceived stress due to PCOS in life			0.744
Less effective	44	45.3 (10.4)	
Quite impressive	130	45.9 (11.7)	
Woman's first supporter			0.001
Mother, father or both	64	40.5 (7.3)	

Table 1. Continued

Spouse	84	49.3 (12.7)	
Other [†]	26	47.1 (10.2)	
Satisfaction with sexual relationship			0.163
Dissatisfied	21	46.7 (16.3)	
Rarely satisfied	68	44.9 (9.8)	
Fully satisfied	44	49.2 (11.2)	
Suffering from infertility or having a history of infertility^{§§}			0.867
No	38	46.5 (11.4)	
Yes	96	46.9 (12.5)	
Evaluation for infertility in the past^{§§}			0.973
No	64	46.8 (11.4)	
Yes	70	46.7 (12.9)	
Active efforts to become pregnant^{§§}			0.640
< 9 months	102	44.5 (10.6)	
> 9 months	32	48.3 (12.4)	

* Standard Deviation; † One participant was widowed; ‡ 7 people were unemployed; † Including support from friends, relatives or medical staff; §§ In married women.

1). The variables of BMI, ethnicity, marital status, woman's job, the first supporter, sexual satisfaction and menstrual cycle intervals that had $P < 0.2$ and also health-promoting lifestyle and its subdomains were entered into backward multiple linear regression model that resulted in exclusion of total health-promoting lifestyle, nutrition, physical activity, interpersonal relationships, marital status, ethnicity, first supporter and sexual satisfaction. Health responsibility, stress management, spiritual growth, BMI, woman's job and menstrual cycle intervals remained in the model and explained 39.1% of the variance of the quality of life (Table 3).

Discussion

This was the first study in Iran to evaluate health-promoting behaviors and its relationship with the quality of life among women with PCOS. The results showed a moderate total score for health-promoting lifestyle and the quality of life. Health responsibility, stress management, spiritual growth, BMI, woman's job and menstrual cycle intervals were predictors of quality of life.

The results indicated that quality of life in women with PCOS was moderate that is consistent with other studies in Iran (21) and America (22) conducted on women with PCOS. The concerns of these women about infertility issues and health risks associated with this syndrome have had negative effects on their quality of life. Nicandri and Hoeger suggested that it is important to modify lifestyle as the first-line treatment and proceed with interventions and treatments without delay to improve their health in the long term (23).

In this study, one of the predictors of quality of life was health responsibility which had a significant correlation with the quality of life, such that increased health responsibility improved their quality of life. According to the results of a study conducted in Teheran, Iran, from

Table 2. Total Score of Health-promoting Lifestyle- II and its Dimensions and Their Relationship With Quality of Life in Women With PCOS Referred to Public and Private Clinics for Infertility in Urmia (n = 174)

Variable	Mean (SD)	Obtainable Range	Obtained Practical Range	Correlated With Quality of Life, <i>r</i> (<i>P</i>)
Health-promoting lifestyle- II	2.2 (0.3)	1 to 4	1.6 to 3.2	0.3 (<0.001)
Nutrition	2.9 (0.5)	1 to 4	1.9 to 4.2	0.2 (0.012)
Interpersonal relationships	2.4 (0.5)	1 to 4	1.4 to 3.7	0.3 (<0.001)
Health responsibility	2.6 (0.4)	1 to 4	1.2 to 3.9	0.2 (0.006)
Physical activity	1.6 (0.5)	1 to 4	1 to 2.9	0.3 (<0.001)
Stress management	1.2 (0.5)	1 to 4	1.1 to 3.6	0.1 (0.161)
Spiritual growth	2.2 (0.6)	1 to 4	1 to 3.7	0.3 (<0.001)
Quality of Life	45.8 (11.3)	0 to 100	20.9 to 84.6	–

Abbreviation: SD, standard deviation.

Table 3. The Predictors of Quality of Life in Women With PCOS Referred to Public and Private Clinics for Infertility in Urmia (n = 174)

Variable	B (CI 95%)	P Value
Health responsibility	4.5 (1.1 to 7.9)	0.009
Stress management	- 5.6 (- 9.3 to -2.0)	0.003
Spiritual growth	6.3 (3.3 to 9.3)	<0.001
Body mass index		
18.5-24.9 (Ref)	0	
25-29.9	- 6.6 (- 10.2 to -3.0)	<0.001
≥30	- 12.2 (- 15.6 to -8.8)	<0.001
Women's job		
Employed (Ref)	0	
Housewife	2.7 (-0.2 to 5.5)	0.064
Mean interval between 2 consecutive menstruation		
21-35 days (Ref)	0	
<21 days	- 3.0 (- 7.7 to 1.7)	0.214
>35 days	- 5.7 (- 8.9 to - 2.5)	0.001

Adjusted R²= 39.1 %

Iranian women's perspective, health preservation was known as a personal obligation, thus women have realized the importance of prevention and consider themselves responsible for their health preservation (9). The effect of responsibility is such that not only the physician is responsible for individual's health, but also the individual obtains necessary knowledge about her disease and shares it with her physician, and as such is involved in management of her health (24).

In this study, increased mean score of spiritual growth increased women's quality of life. The spiritual aspect is an important aspect of human function and positively influences the health (25). In this study, overweight and obese women compared to women with normal BMI (18.5 to 24.9) had lower quality of life. Weight loss is absolutely vital in the treatment of PCOS but the support given to PCOS patients to help reduce their weight is not adequate and more measures are needed for improvement in this area (26).

In this study, housewives had a better quality of life

than employed women. However, the results of a research suggested that employed women had a better quality of life than housewives (27). In contrast, a study suggested that employed women are not superior to housewives except for physical dimension (28). In this case, a study suggests that there is no significant difference between employed women and housewives in terms of the quality of life; however, the study recommended that measures be taken to improve housewives' quality of life (29).

Irregular menstrual cycles were also a predictor of quality of life in these women, as women with menstrual cycle disorders experienced lower quality of life than women with normal menstrual cycles. This result is consistent with 2 studies conducted in Malaysia (30) and Hong Kong (31), in which menstrual disorders in women affected health-related quality of life. Likewise, a study conducted in Michigan and East Tennessee State University reported that after obesity, menstrual disorders lead to decreased quality of life in these women (5). In contrast, according to a study conducted in Germany on women with PCOS compared with healthy women to determine the effect of PCOS symptoms on quality of life, including mental health and sexual satisfaction, a variety of menstrual disorders and even infertility did not affect the mental health of these women (32). The emotional consequences of infertility are modulated by several factors such as the ethnic, cultural and societal context (33). In addition, as the infertility and irregular menstrual cycles are more important in married women, the cause of the observed contrast may probably be due to difference in marital status of participants in the present study and the study conducted in Germany. In our study, only about one-fifth of participants (22.98) were single but in the above mentioned study, half of women (50%) were single.

Given the above, controlling BMI and regulating their menstrual cycles can lead to better quality of life in women with PCOS. Furthermore, the quality of life of these women can be greatly improved by strengthening their sense of responsibility and spiritual growth while managing their stress.

Using of valid and standard questionnaires is the

strength of this study. Given that this is a cross-sectional study, the relationship shown between quality of life and dimensions of health-promoting lifestyle and some socio-demographic and obstetric characteristics do not necessarily indicate a causal relationship. Also, the method of sampling is another limitation of this study that reduces the generalizability of the findings. According to the results, it is recommended that barriers and facilitators of health-promoting lifestyle be explained from the perspective of women with PCOS so that solutions can be adopted to overcome barriers and to strengthen facilitators, and hence the quality of life can be improved in these women.

Conclusion

The results show that the score of health-promoting lifestyle and quality of life of women with PCOS is moderate. There is a significant relationship between health-promoting lifestyle and quality of life. Some socio-demographic variables such as BMI, woman's job and menstrual cycle intervals are also predictors of quality of life in these women. Therefore, a holistic approach should be considered to improve the quality of life for these women and all factors affecting the quality of life should be taken into account to prevent the disease complications.

Ethical issues

The Ethics Committee of Tabriz University of Medical Sciences approved the study (Ethical code No. TBZMED.REC.1394.341).

Conflict of Interests

We hereby declare that there is no conflict of interests.

Financial Support

This study was approved and funded by Tabriz University of Medical Sciences, Tabriz, Iran.

Acknowledgments

We greatly appreciate the cooperation and assistance provided by the Research Deputy of the University and all employees in Shahid Motahari Hospital, Urmia and gynecologists in the hospital and all related centers.

Supplementary Materials

Supplementary file contains Health-Promoting Lifestyle Profile II and Polycystic Ovary Syndrome Questionnaire (PCOSQ) questionnaires.

References

1. Kauffman RP, Baker TE, Baker VM, DiMarino P, Castracane VD. Endocrine and metabolic differences among phenotypic expressions of polycystic ovary syndrome according to the 2003 Rotterdam consensus criteria. *Am J Obstet Gynecol.* 2008;198(6):670.e671-677. e677-610. doi:10.1016/j.ajog.2008.01.037
2. Fauser BC, Tarlatzis BC, Rebar RW, et al. Consensus on women's health aspects of polycystic ovary syndrome (PCOS): the Amsterdam ESHRE/ASRM-Sponsored 3rd PCOS Consensus Workshop Group. *Fertil Steril.* 2012;97(1):28-38.e25. doi:10.1016/j.fertnstert.2011.09.024
3. Tehrani FR, Solaymani-Dodaran M, Hedayati M, Azizi F. Is polycystic ovary syndrome an exception for reproductive aging? *Hum Reprod.* 2010;25(7):1775-1781. doi:10.1093/humrep/deq088
4. El-Mazny A, Abou-Salem N, El-Sherbiny W, El-Mazny A. Insulin resistance, dyslipidemia, and metabolic syndrome in women with polycystic ovary syndrome. *Int J Gynaecol Obstet.* 2010;109(3):239-241. doi:10.1016/j.ijgo.2010.01.014
5. McCook JG, Reame NE, Thatcher SS. Health-related quality of life issues in women with polycystic ovary syndrome. *J Obstet Gynecol Neonatal Nurs.* 2005;34(1):12-20. doi:10.1177/0884217504272945
6. Mirghafourvand M, Mohammad-Alizadeh Charandabi S, Asghari Jafarabadi M, Tavananezhad N, Karkhane M. Predictors of health-related quality of life in Iranian women of reproductive age. *Appl Res Qual Life.* 2016;11(3):723-737. doi: 10.1007/s11482-015-9392-0
7. Colwell HH, Mathias SD, Pasta DJ, Henning JM, Steege JF. A health-related quality-of-life instrument for symptomatic patients with endometriosis: a validation study. *Am J Obstet Gynecol.* 1998;179(1):47-55.
8. The WHO cross-national study of health behavior in school-aged children from 35 countries: findings from 2001-2002. *J Sch Health.* 2004;74(6):204-206.
9. Baheiraei A, Mirghafourvand M, Charandabi SM, Mohammadi E. Facilitators and Inhibitors of Health-promoting Behaviors: The Experience of Iranian Women of Reproductive Age. *Int J Prev Med.* 2013;4(8):929-939.
10. Baheiraei A, Mirghafourvand M, Mohammadi E, Charandabi SM. The experiences of women of reproductive age regarding health-promoting behaviours: a qualitative study. *BMC Public Health.* 2012;12:573. doi:10.1186/1471-2458-12-573
11. Hackett TP, Cassem NH. Factors contributing to delay in responding to the signs and symptoms of acute myocardial infarction. *Am J Cardiol.* 1969;24(5):651-658.
12. Hoeger KM. Role of lifestyle modification in the management of polycystic ovary syndrome. *Best Pract Res Clin Endocrinol Metab.* 2006;20(2):293-310. doi:10.1016/j.beem.2006.03.008
13. Clark AM, Thornley B, Tomlinson L, Galletley C, Norman RJ. Weight loss in obese infertile women results in improvement in reproductive outcome for all forms of fertility treatment. *Hum Reprod.* 1998;13(6):1502-1505.
14. Thomson RL, Buckley JD, Lim SS, et al. Lifestyle management improves quality of life and depression in overweight and obese women with polycystic ovary syndrome. *Fertil Steril.* 2010;94(5):1812-1816. doi:10.1016/j.fertnstert.2009.11.001
15. Moran LJ, Hutchison SK, Norman RJ, Teede HJ. Lifestyle changes in women with polycystic ovary syndrome. *Cochrane Database Syst Rev.* 2011(2):Cd007506. doi:10.1002/14651858.CD007506.pub2
16. Hoeger K, Davidson K, Kochman L, Cherry T, Kopin L, Guzik DS. The impact of metformin, oral contraceptives, and lifestyle modification on polycystic ovary syndrome in obese adolescent women in two randomized, placebo-controlled clinical trials. *J Clin Endocrinol Metab.* 2008;93(11):4299-4306. doi:10.1210/jc.2008-0461
17. Walker SN, Sechrist KR, Pender NJ. The Health-Promoting

- Lifestyle Profile: development and psychometric characteristics. *Nurs Res.* 1987;36(2):76-81.
18. Mirghafourvand M, Baheiraei A, Nedjat S, Mohammadi E, Charandabi SM, Majdzadeh R. A population-based study of health-promoting behaviors and their predictors in Iranian women of reproductive age. *Health Promot Int.* 2015;30(3):586-594. doi:10.1093/heapro/dat086
 19. Cronin L, Guyatt G, Griffith L, et al. Development of a health-related quality-of-life questionnaire (PCOSQ) for women with polycystic ovary syndrome (PCOS). *J Clin Endocrinol Metab.* 1998;83(6):1976-1987. doi:10.1210/jcem.83.6.4990
 20. Amini L, Ghorbani B, Montazeri A. Iranian version of health-related quality of life for women with polycystic ovary syndrome (PCOSQ): translation, reliability and validity. *Payesh.* 2012;11(2):227-233.
 21. Amini L, Ghorbani B, Montazeri A, et al. Quality of life for women with polycystic ovary syndrome. *Payesh.* 2012;11(6):857-862.
 22. Trent ME, Rich M, Austin SB, Gordon CM. Fertility concerns and sexual behavior in adolescent girls with polycystic ovary syndrome: implications for quality of life. *J Pediatr Adolesc Gynecol.* 2003;16(1):33-37.
 23. Nicandri KE, Hoeger K. Diagnosis and treatment of polycystic ovarian syndrome in adolescents. *Curr Opin Endocrinol Diabetes Obes.* 2012;19(6):497-504. doi:10.1097/MED.0b013e32835a1a03
 24. Avery JC, Braunack-Mayer AJ. The information needs of women diagnosed with Polycystic Ovarian Syndrome-implications for treatment and health outcomes. *BMC Womens Health.* 2007;7:9. doi:10.1186/1472-6874-7-9
 25. Sehhatie F, Mirghafourvand M, Momeni K. Health promoting behaviors among postmenopausal women in langroud city, Iran. *Int J Womens Health Reprod Sci.* 2015;3(3):158-162. doi: 10.15296/ijwhr.2015.33
 26. Humphreys L, Costarelli V. Implementation of dietary and general lifestyle advice among women with polycystic ovarian syndrome. *J R Soc Promot Health.* 2008;128(4):190-195.
 27. Vahdaninia M, Goshtasbi A, Montazeri A, Maftoun F. Health-related quality of life in an elderly population in Iran: a population-based study. *Payesh.* 2005;4(2):113-120.
 28. Reisine S, Fifield J, Walsh S, Dauser D. Employment and quality of life outcomes among women with fibromyalgia compared to healthy controls. *Women Health.* 2004;39(4):1-19. doi:10.1300/J013v39n04_01
 29. Saravi FK, Navidian A, Rigi SN, Montazeri A. Comparing health-related quality of life of employed women and housewives: a cross sectional study from southeast Iran. *BMC Womens Health.* 2012;12:41. doi:10.1186/1472-6874-12-41
 30. Nur Azurah AG, Sancu L, Moore E, Grover S. The quality of life of adolescents with menstrual problems. *J Pediatr Adolesc Gynecol.* 2013;26(2):102-108. doi:10.1016/j.jpag.2012.11.004
 31. Chung PW, Chan SS, Yiu KW, Lao TT, Chung TK. Menstrual disorders in a Paediatric and Adolescent Gynaecology Clinic: patient presentations and longitudinal outcomes. *Hong Kong Med J.* 2011;17(5):391-397.
 32. Hahn S, Janssen OE, Tan S, et al. Clinical and psychological correlates of quality-of-life in polycystic ovary syndrome. *Eur J Endocrinol.* 2005;153(6):853-860. doi:10.1530/eje.1.02024
 33. al Ma'aitah R, Haddad L, Umlauf MG. Health promotion behaviors of Jordanian women. *Health Care Women Int.* 1999;20(6):533-546. doi:10.1080/073993399245449

Copyright © 2017 The Author (s); This is an open-access article distributed under the terms of the Creative Commons Attribution License (<http://creativecommons.org/licenses/by/4.0>), which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited.