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Health Related Quality of Life and Depression among Women with Poly Cystic Ovary Syndrome (PCOS) in Pakistan.

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ABSTRACT

Polycystic ovary syndrome is a multifactorial disease caused by both genetic and environmental factors acting concurrently with rising prevalence at an alarming rate. It is a health problem that affects 1 out of 10 women of childbearing age. PCOS have negative impact on quality of life resulting in depression. The present study was designed to assess health related quality of life and depression among polycystic ovary syndrome patients in Pakistan. A descriptive cross sectional study design was used to assess health related quality of life and depression among 152 women with PCOS diagnosed by Rotterdam criteria using PCOSQ-50 and HADS. Data was collected and statistically analysed. Significant difference ($p \geq 0.05$) among different domain of HRQoL and level of depression among women with PCOS was observed. Unmarried patients had better emotions while body hairs, weight and infertility effect married women. Rural patients had relatively poor HRQoL. Women with PCOS in age group 26-35yrs had impaired HRQoL due to infertility, emotions and increased weight. Obese patients with PCOS had relatively more impaired HRQoL as all domains were affected in them. Women with PCOS residing in rural areas were found relatively more depressed and those belonging to low educational and income background were comparatively found more depressed. The results of the present study concluded that polycystic ovary syndrome had a negative impact on health related quality of life of patients across all domains with a significant likelihood of depression. While all domains were affected, the greatest impact was seen on infertility followed by body hairs and role limitation due to increased psychological and emotional problems. Low educational and income background had negative effect on mental and emotional HRQoL of polycystic ovary syndrome patients and depression. More attention should be given on improvement of health related quality of life among PCOS patients to decrease the rate of treatment failure and improve treatment response.

Keywords: Depression, health related quality of life, poly cystic ovary syndrome (PCOS), women, Pakistan.

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INTRODUCTION

Polycystic ovary syndrome (PCOS) is a multifactorial disease caused by both genetic and environmental factors acting concurrently with rising prevalence at an alarming rate. It is a health problem that affects 1 out of 10 women of childbearing age. Approximately 6.6% of unselected reproductive-aged women are diagnosed with PCOS in USA. The annual cost burden is 93 million dollar for initial evaluation only and total cost for evaluation and treatment for reproductive-aged PCOS women is 4.36 billion dollar in USA. Polycystic ovary syndrome affects 15-20% of reproductive women [1]. Approximately 5-10% women are affected by PCOS in fertility ages [2]. PCOS have negative impact on quality of life. Infertility is main cause of decrease quality of life in women age above 25 year [3]. PCOS can also lead to abortion [2]. Quality of life determinants depends upon different demographic variables. Hirsutism, oligomenorrhea or amenorrhea, hypertension, weight gain, hair loss and acne shows significant association with PCOS 4. Hirsutism is main cause of decrease quality of life among women below 25 years of age [3]. On the other hand, infertility is one of the main reason for decreased quality of life in women age above 25 year [3].The increasing prevalence of depression in PCOS patients has been reported significantly with time [5]. Obesity, body hair, and infertility may decrease self-confidence and create depressive symptoms in patients with PCOS [6]. In addition, changes in hormonal levels may lead to anxiety directly [6].Insulin resistance is significantly associated with depression in patients with polycystic ovary syndrome patients [7]. Poor body image cause inauspicious consequences on sexual satisfaction of women with PCOS [8]. Acne appearing mostly on face effects the personality of a patient which decreased quality of life [8]. Moreover, outer appearance cause depression in PCOS women [9].

The importance of health related quality of life of polycystic ovary syndrome patients has been long recognized in developed countries but in developing countries like Pakistan this concept is still in early stages. The prevalence of PCOS among general population is 3-7 % while in 20.7 % of the cases it is associated due to different co morbidities and in 6-8% of the cases it leads to infertility [10]. PCOS is associated with obesity in 60% of the women and also increases the risk of diabetes and cardiovascular disease in 10 % and 33 % of the women, respectively [10]. A study reported that nearly 85-90% of women suffer oligomenorrhoea while 30-40% present with amennorhoea as clinical features of anovulation but not all patients show these symptoms while PCOS was diagnosed in 16 % of the patient during surgery [11]. The prevalence of PCOS among women in Pakistan was reported to be 5-10% of those in fertility age while 40% of the women suffer from depression particularly in adolescent age [12]. Depression was found significantly associated with PCOS women in Pakistan [4]. Depression in PCOS patients was found mainly due to obesity, infertility, hirsutism, menstrual irregularity and insulin

resistance [13]. Hirsutism was reported in 36.7 % of the women with PCOS in Pakistan [14]. While almost 50% of patients with PCOS are obese [11].

Although, polycystic ovary syndrome is a common endocrine disorder but only 10% of the population is aware of the disease in Pakistan [14]. Out of 51.8% obese women and 22.2 % of them who were extremely obese, 55.6% were unaware of polycystic ovary disease [15]. The major reasons for the increasing burden of the disease is lack of awareness, healthcare facilities, technical equipment's for diagnosis and financial support due to which most of the people are left untreated, resulting in decrease quality of life and increased depression. In the past few decades, various contributing factors effecting quality of life were studied worldwide for better understanding of different aspects associated with decreased health related quality of life and increased psychosocial burden among PCOS women, but women reproductive health is still one of the neglected areas in most of the developing countries including Pakistan. Therefore, the present study was designed to assess health related quality of life and depression among polycystic ovary syndrome patients in Pakistan.

MATERIALS AND METHOD

A descriptive cross sectional study design was used to determine the health related quality of life and depression among polycystic ovary syndrome patients in Pakistan. Study approval was taken from the Ethical Committee of Hamdard University (BASR-81-5.2). Approval was also taken from Medical superintendents of different hospitals located in Rawalpindi and Islamabad. Patients were briefed regarding nature and objectives of the study and verbal and written consent were obtained prior to data collection**.** Respondents were assured of the confidentiality of their responses and their right to withdraw from the study at any time. Health care facilities both from public and private sector were included in study. Polycystic ovary syndrome patients diagnosed using Rotterdam criteria from different public and private clinics of Pakistan were included as study respondents. Rotterdam criteria require two of three features: polycystic ovaries (PCO) on ultrasound, an ovulatory irregular cycles or hyper androgenism. Polycystic ovary syndrome patients were selected on following criteria from age group of 15 to 50 years old, married or unmarried and persons who could speak & understand Urdu or English. Any patient having known depression was excluded from the study. Women with ovulatory dysfunction from other causes such as hyperprolactinemia, as well as pregnancy in reproductive-aged women were also excluded.

Sample size was calculated using Raosoft® sample size calculator which came to be 323 patients in order to achieve 95% confidence level with 5% margin of error. As no updated list of number of polycystic ovary syndrome patients in Pakistan is available, convenient sampling technique was used. According to convenient sampling technique all the accessible respondents

that were present at the time of data collection were included in study. The questionnaires were filled by 152 patients and the response rate of the study was 47%. Two pre- validated questionnaires were used i.e. PCOS-Q (Polycystic Ovary Syndrome Questionnaire) to measure Health Related Quality of Life (HRQoL) and HADS (Hospital Anxiety & Depression Scale) to measure depression.

The PCOSQ-50 is used worldwide to measure Health Related Quality of Life of polycystic ovary syndrome patients. It consist of 50 items representing 6 sections, namely; psychosocial and emotional, body weight and menstrual disorders, fertility, sexual function, body hair disorders, and coping. Each item could be answered by picking options on a 5-point Likert scale and will assess by a 7-point scale (1-poor/7no problem). The higher the scores, better the condition [1]. By using confirmatory factor analysis 43 items of PCOSQ show relevant validity and reliability to assess HRQoL [8]. The HADS Questionnaire consists of fourteen items designed to assess anxiety and depression in medical patients. Out of all, seven items are related to anxiety and seven to depression. Scores for each subscale (anxiety and depression) range from 0 to 21 with scores categorized as; Normal 0-7, mild 8-10, moderate 11-14, and severe 15-21. Scores for the entire scale (emotional distress) range from 0 to 42, with higher scores indicate more distress.

Pilot testing was performed on 10% of sample size for reliability of tool. The value of Cronbach's alpha was 0.72 for Polycystic Ovary Syndrome Questionnaire (PCOS-50) and 0.75 for Hospital Anxiety and Depression Scale (HADS). The questionnaires were self-administered to the respondents by principal investigator and collected back on the same day to avoid study biasness. After data collection, data was cleaned, coded and entered in SPSS version-21. Descriptive statistics comprising of percentages and frequencies were calculated. Mann-Whitney and Kruskal-Wallis Test ($p \geq 0.05$) were used to find the difference among different variables.

RESULTS AND DISCUSSION

Out of 152 respondents, 50.7% (n=77) were married, 46.1% (n=70) were unmarried, 2.6% (n=4) divorced and 0.7% (n=1) was widow. Of the total respondents, 3.9% (n=6) were illiterate and 32.2% (n=49) were graduates. Regarding the job status of the respondents, 21.7% (n=33) were employed where as 78.3% (n=119) were unemployed, of whom 50% (n=76) were housewives and 28.3% (n=43) were studying. Out of all the respondents, 10.5% (n=16) had regular periods, 88.8% (n=135) had irregular periods and 0.7% (n=1) had no periods because of menopause. Moreover, 75.7% (n=115) had no children and 2% (n=3) had more than four children. While, 33.6% (n=51) were on hormonal therapy and 59.9% (n=91) were not on any therapy. A detailed description is given (Table 1).

Table 1: Demographic Characteristics of Respondents

Variable	Indicator	Total n (%)	Variable	Indicator	Total n (%)
Age	15-25	84 (55.3)	Marital status	Married	77 (50.7)
	26-35	51 (33.6)		Single	70 (46)
	36-50	17 (11.2)		Divorced	4 (2.6)
				widow	1 (0.7)
Qualification	Illiterate	6 (3.9)	Income level	≤15,000	46 (30.3)
	Primary	25 (16.4)		15,001-25,000	32 (21.1)
	Secondary	55 (36.2)		25,001-35,000	41 (27)
	Bachelors	49 (32.2)		35,001-50,000	26 (17)
	Masters	16 (10.5)		≥50,000	7 (4.6)
	Post graduate	1 (0.7)			
Working status	Employed	33 (21.7)	No. of children	None	115 (75.6)
	House wife	76 (50)		one	10 (6.6)
	studying	43 (28.3)		two	10 (6.6)
				three	11 (7.2)
				four	3 (2)
				> four	3 (2)
Type of comorbidity	None	134 (88.2)	Type of therapy	Hormonal therapy	51 (33.8)
	Hypertension	9 (5.9)		Other	10 (6.6)
	Other	2 (1.3)		None	91 (59.9)
	Both	7 (4.6)			
Thyroid problem	Yes	3 (2)	Built of patient	Heavy	87 (57.2)
	No	149 (98)		Normal	37 (24.4)
				slim	28 (18.4)
Problem in conceiving	Yes	54 (35.5)	periods	Regular	16 (10.5)
	no	98 (64.5)		Irregular	135 (88.8)
				No periods	1 (0.7)

The results showed lowest scores for HRQoL were observed in domain of infertility (38.03, ± 27.820) followed by domain of psychosocial and emotional (46.98, ± 22.51) whereas highest scores were observed in the domain of body weight (53.36, ± 21.59). A detailed description is given in (Table 2).

Table 2 Domains of Health Related Quality of Life (HRQOL) among PCOS Women

Indicator	Mean	Median	Standard Deviation
Psychosocial and emotional	46.98	45.00	22.515
Infertility	38.03	31.25	27.820
Menstrual	48.73	46.43	24.456
Body weight	53.36	50.00	21.598
Body hair	47.70	45.00	22.507

Comparison of HRQoL domains in relation to different demographic characteristics demonstrated significant difference ($p \geq 0.05$) among different domain of HRQoL. The comparison showed that unmarried patients had better emotions while body hairs, weight and infertility effect married women. Rural patients had relatively poor HRQoL. Emotions were better managed among women with PCOS in age group 36-50 yrs while body weight, body hairs and infertility were found better among women of age group 15-25yrs while women with

PCOS in age group 26-35yrs had impaired HRQoL due to infertility, emotions and increased weight. Obese patients with PCOS had relatively more impaired HRQoL as all domains were affected in them (Table 3).

Table 3 Comparison of HRQoL domains among PCOS Women by Demographic Characteristics

Demographics	**Emotions**				**Body hairs**			
	n	**Mean rank**	**Test stat**	**P value**	**n**	**Mean rank**	**Test stats**	**P value**
Organization	Public=114 Private=38	79.13 68.61	1866.000[a]	0.199	114 38	75.88 78.37	2095.000[a]	0.767
Marital status	Married=77 Single=70	80.64 66.70	2184.000[a]	**0.044[b]**	77 70	97.60 48.04	877.500[a]	**0.001**
setting	Urban=112 Rural=40	72.12 88.76	1749.500[a]	**0.043**	112 40	72.43 87.90	1784.000[a]	**0.054**
Age of patient	15-25=84 26-35=51 36-50=17	70.96 90.57 61.65	8.492[b]	**0.013**	84 51 17	60.64 99.76 85.09	25.943[b]	**0.002**
Level of education	Illiterate=6 Primary=25 Secondary=55 Bachelors=49 Master=16	105.42 102.30 73.54 67.44 58.56	16.389[b]	**0.001**	6 25 55 49 16	100.75 106.98 71.02 63.47 73.81	19.350[b]	**0.002**
No of children	1=10 2=10 3=11 4=3 >4=3	22.65 20.95 21.00 5.00 7.00	10.583[b]	**0.022**	10 10 11 3 3	22.80 21.00 18.50 9.83 10.67	5.585[b]	0.238
Income	≤15,000=46 15001-25,000=32 25,001-35,000=41 35,001-50,000=26 ≥50,000=7	90.29 73.11 68.90 72.40 61.07	7.029[b]	0.132	46 32 41 26 7	88.79 77.34 69.07 62.04 89.07	8.188[b]	0.084
Work status	Employed= 33 House wife= 76 Studying= 43	72.82 81.89 69.80	2.370[b]	0.315	33 76 43	65.32 96.52 49.70	33.976[b]	**0.002**
Type of comorbidity	None=134 Hypertension=9 Other=2	72.26 94.89 24.25	5.192[b]	0.062	134 9 2	71.93 97.83 32.75	5.097[b]	0.071
Type of therapy	Hormonal= 51	81.91	1.165[b]	0.567[b]	51	79.58	0.727[b]	0.710

	Other= 10 None=91	73.10 73.84			10 91	67.15 75.80		
Thyroid problem	Yes= 3 No= 149	84.83 76.33	198.500[a]	0.759	3 149	102.00 75.99	147.000[a]	0.332
Built of patient	Heavy=87 Normal= 37 Slim= 28	87.29 60.80 63.71	12.328[b]	**0.002**	87 37 28	84.82 58.92 73.89	9.155[b]	**0.011**

Mann-Whitney Test ($p \geq 0.05$)[a], Krsukal Wallis Test ($p \geq 0.05$[b]).

Demographics	**Body weight**				**Infertility**				**Menstrual**			
	n	**Mean rank**	**Test stats**	**P value**	**n**	**Mean rank**	**Test stats**	**P value**	**n**	**Mean rank**	**Test stats**	**P value**
Organization	114 38	74.65 82.04	1955.5000[a]	0.369	114 38	73.80 84.59	1858.500[a]	0.193	114 38	77.95 72.14	2000.500[a]	0.476
Marital status	77 70	101.46 43.79	580.500[a]	**0.002**	77 70	104.01 40.99	384.000[a]	**0.004**	77 70	74.97 72.93	2620.000[a]	0.774
setting	112 40	72.84 86.74	1830.500[a]	0.086	112 40	71.83 89.56	1717.500[a]	**0.027**	112 40	73.92 83.71	1951.500[a]	0.226
Age of patient	84 51 17	57.78 103.19 88.94	35.496[b]	**0.004**	84 51 17	57.36 102.78 92.21	36.509[b]	**0.002**	84 51 17	74.96 83.24 63.91	2.709[b]	0.260
Level of education	6 25 55 49 16	103.25 104.24 80.21 63.00 47.00	24.772[b]	**0.003**	6 25 55 49 16	99.17 115.16 73.56 60.61 61.63	29.933[b]	**0.004**	6 25 55 49 16	104.50 96.22 75.22 70.54 53.13	13.159[b]	0.009
No of children	10 10 11 3 3	17.90 25.20 19.36 6.33 13.33	8.500[b]	0.064	10 10 11 3 3	18.05 23.40 19.77 10.67 13.00	4.530[a]	0.349	10 10 11 3 3	19.90 23.45 19.77 8.33 9.00	7.376[a]	0.111
Income	46 32 41 26 7	85.89 68.81 75.55 65.62 95.93	6.077[b]	0.194	46 32 41 26 7	87.53 70.67 73.70 61.37 103.29	9.355[b]	**0.049**	46 32 41 26 7	89.86 65.42 72.05 72.62 79.86	6.983[b]	0.132

Work status	33 76 43	60.79 98.74 49.24	40.325[b]	**0.002**	33 76 43	67.26 96.13 48.90	33.745[b]	**0.004**	33 76 43	75.06 79.04 73.12	0.547[a]	0.766
Type of comorbidity	134 9 2	71.62 99.00 48.75	4.286[b]	0.109	134 9 2	72.37 94.44 18.75	5.761[b]	**0.040**	134 9 2	73.20 80.28 27.00	2.696[b]	0.280
Type of therapy	51 10 91	72.06 97.25 76.71	2.759[ba]	0.252	51 10 91	77.10 81.90 75.57	0.202[b]	0.915	51 10 91	74.70 64.45 78.84	1.100[b]	0.589
Thyroid problem	3 149	128.67 75.45	67.000[a]	**0.037**	3 149	112.67 75.77	115.000[a]	0.165	3 149	82.00 76.39	207.000[a]	0.835
Built of patient	87 37 28	91.77 46.16 69.14	28.991[b]	**0.002**	87 37 28	91.34 53.26 61.11	23.812[a]	**0.003**	87 37 28	86.44 62.30 64.39	10.489[a]	**0.005**

The results highlighted that 42.1% (n = 64) of the patients feel tense most of the time and 59.9% (n = 91) felt sort of frightened feeling very definitely and quite badly as if something awful is about to happen. Most patients having a great deal of the time worrying thoughts go through their mind (n = 114, 75%) and 8.6 % (n = 13) did not feel cheerful often. On the other hand, 13.8 % (n = 21) definitely lost interest in their appearance, 53.3% (n = 81) get panic very often and 24.3 % (n = 37) not often enjoy a book or TV program (Table 4).

Table 4: Assessment of Depression among Polycystic Ovary Syndrome Women

Indicators		**n (%)**
I feel tense or 'wound up';	Not at all	1 (0.7)
	From time to time, occasionally	42 (27.6)
	A lot of the time	45 (29.6)
	Most of the time	64 (42.1)
I still enjoy the things I used to enjoy	Definitely as much	54 (35.5)
	Not quite so much	36 (23.7)
	Only a little	35 (23)
	Hardly at all	27 (17.8)
I get a sort of frightened feeling as if something awful is about to happen	Not at all	23 (15.1)
	A little, but it doesn't worry me	19 (12.5)
	Yes, but not too badly	19 (12.5)
	Very definitely and quite badly	91 (59.9)
I can laugh and see the funny side of things	Not at all	20 (13.2)
	Definitely not so much now	30 (19.7)
	Not quite so much now	42 (27.6)
	As much as I always could	60 (39.5)
Worrying thoughts go through my mind	Only occasionally	6 (3.9)
	From time to time, but not too often	18 (11.8)
	A lot of the time	
	A great deal of the time	14 (9.2)
		114 (75)
I feel cheerful	Most of the time	35 (23)
	Sometimes	61 (40.1)
	Not often	43 (28.3)
	Not at all	13 (8.6)
I can sit at ease and feel relaxed	Definitely	13 (8.6)
	Usually	72 (47.4
	Not Often	58 (38.2)
	Not at all	9 (5.9)
I feel as if I am slowed down	Not at all	17 (11.2)
	Sometimes	32 (21.1)
	Very often	52 (34.2)
	Nearly all the time	51 (33.6)
I get a sort of frightened feeling like 'butterflies' in the stomach	Not at all	24 (15.8)
	Occasionally	52 (34.2)
	Quite Often	55 (36.2)
	Very Often	21 (13.8)
I have lost interest in my appearance	I take just as much care as ever	56 (36.8)
	I may not take quite as much care	25 (16.4)
	I don't take as much care as I should	50 (32.9)
	Definitely	21 (13.8)

I feel restless as I have to be on the move	Not at all	6 (3.9)
	Not very much	25 (16.4)
	Quite a lot	70 (46.1)
	Very much indeed	51 (33.6)
I look forward with enjoyment to things	As much as I ever did	70 (46.1)
	Rather less than I used to	30 (19.7)
	Definitely less than I used to	27 (17.8)
	Hardly at all	25 (16.4)
I get sudden feelings of panic	Very often indeed	81 (53.3)
	Quite often	40 (26.3)
	Not very often	27 (17.8)
	Not at all	4 (2.6)
I can enjoy a good book or radio or TV program	Often	37 (24.3)
	Sometimes	38 (25)
	Not often	37 (24.3)
	Very seldom	40 (26.3)

No significant difference ($p \geq 0.05$) in level of depression among PCOS women were observed in relation to different demographic variables including sector, marital status, setting, age, number of children, type of therapy, work status and those with thyroid issues. Significant difference ($p \geq 0.05$) in level of depression among PCOS women were observed in relation to setting, qualification and income levels. Women with PCOS residing in rural areas were found relatively more depressed and those belonging to low educational and income background were comparatively found more depressed (Table 5).

Table 5 Comparison of Depression among Polycystic Ovary Syndrome Women by Demographic Characteristics

Demographics	**Composite score**			
	n	**Mean rank**	**Test statistics**	**P-value**
Sector	Public = 114	75.29	2028.500[a]	0.567
	Private= 38	80.12		
Marital status	Married= 77	71.87	2531.000[a]	0.527
	Unmarried= 70	76.34		
Setting	Urban= 112	72.76	1821.000[a]	**0.03**
	Rural= 40	86.98		
Age of patient	15-25 = 84	72.05	3.596[b]	0.166
	26-35 = 51	85.98		
	36-50 = 17	70.03		
Level of education	Illiterate = 6	84.67	9.534 [b]	**0.049**
	Primary = 25	96.80		
	Secondary = 55	71.67		
	Bachelors = 49	75.45		
	Master = 16	56.81		
No of children	One = 10	22.65	7.515[b]	0.111
	Two = 10	21.30		
	Three = 11	19.41		
	Four = 3	9.50		
	More than four = 3	7.17		
Work status	Employed = 33	70.42	1.972[b]	0.373
	House wife = 76	74.91		

	Studying = 43	83.98		
Income	≤ 15,000 = 46	83.41	8.201[b]	**0.042**
	15,001-25,000 = 32	61.81		
	25,001-35,000 = 41	64.16		
	35,001-50,000 = 26	82.29		
Type of therapy	Hormonal = 51	71.61	2.835[b]	0.242
	Other = 10	97.10		
	None = 91	76.98		
Thyroid problem	Yes = 3	55.83	161.500[a]	0.431
	No = 149	76.92		

Mann-Whitney Test [a] ;Krsukal Wallis Test [b] (p≥ 0.05)

DISCUSSION

Polycystic ovary syndrome is one of the common endocrine disorder in adolescent ages which impact negatively on health related quality of life of women. The present study revealed impaired HRQoL among women with polycystic ovary syndrome. Most of them experienced lack of emotional control and mood stability. They also experienced aggressiveness due to PCOS. This might be due to the fact that prolonged physical treatment may lead towards mental and social discomfort. Similar results were reported from a study conducted in Germany highlighting mood disturbances such as irritation, impaired social and sexual and overall decreased life satisfaction among patients suffering from PCOS [9].

PCOS can have an impact on social functioning due to stigma associated with it. Body dissatisfaction strongly associated to it also decrease quality of life [16]. The results of the present study showed patients often felt different from normal women. Most of them felt concerned about being overweight and the need to reduce weight. Moreover, weight reduction was a relatively taken as major concern among married women. Increased growth of body hairs was also considered an important issue in effecting overall quality of life, especially among married women. These finding are in accordance with a study conducted in Bulgaria which reported obesity as a significant feature of illness and had a negative impact on quality of life of PCOS women [17]. The results of the present study further reported infertility as a major factor effecting HRQoL. Similar findings of poor HRQoL has been reported among women having age >25yrs due to infertility [17].

In PCOS patients the actual reason for the depression is unknown and complex [18]. The results of the present study reported low HRQoL along with high levels of depression among PCOS women. Similar high prevalence of depression was found among PCOS women in India [19]. Furthermore, the present study reported that the patients known with thyroid problem and heavy built had poor HRQoL. These results are in line with different studies which also showed that high BMI and increased waist circumference are prone to depression and considered as high risk patient for PCOS [20, 21].

Hirsutism associated with PCOS develops in later stage in life. The results of the present study revealed that body hairs, weight and infertility mostly affect HRQoL of house wives as compared to working women. It was interesting to notice that the concern for weight management, menstruation problems, hirutusim and infertility impacted relatively more on HRQoL among women residing in rural areas. They had poor emotional control and low HRQoL along with higher rates of depression. This might be due to the fact that they have less awareness, access and resources for better treatment and care. Similar finding from a study conducted in USA reported link of depression is associated with hirsutism and disturbed sleep among PCOS women [3].

Higher QoL has been associated with higher education level [22].The results of the present study revealed that illiterate or less educated women having PCOS had impaired HRQoL across all domains. Moreover, they were more depressed as compared to the educated patients. Similar findings were reported from a study conducted in USA highlighting that risk of PCOS decreases in patients who attained high level of education [23]. Income is considered another important factor contributing towards low HRQoL and high rates of depression among PCOS women. The results of present study showed that although, socioeconomic status had no impact on HRQoL of PCOS patients but do have an impact on depression. Although, HRQoL was low among women with different socioeconomic backgrounds but the ones with income less that Rs 15,000 were found relatively more depressed that the others. These findings are in accordance with a study conducted in USA which reported women who undergo low childhood socioeconomic status are at increased risk of polycystic ovary syndrome and higher depression rates in their life [23].Furthermore, the present study revealed that comorbidity and different types of therapy does not affect any domain of HRQoL and depression. Physical activity, acupressure and to lesser extent resveratrol may improve psychological, hormonal and metabolic profile in women with PCOS [24].

CONCLUSION

The results of the present study concluded that polycystic ovary syndrome had a negative impact on health related quality of life of patients across all domains with a significant likelihood of depression. While all domains were affected, the greatest impact was seen on infertility followed by body hairs and role limitation due to increased psychological and emotional problems. Low educational and income background had negative effect on mental and emotional HRQoL of polycystic ovary syndrome patients and depression. More attention should be given on improvement of health related quality of life among PCOS patients to decrease the rate of treatment failure and improve treatment response. Moreover, awareness programs targeting patients with low educational level should be initiated to increase health

awareness related to impact of mental and emotional wellbeing on HRQoL among PCOS patients. All stakeholders need to work together for enhancement of physical and mental health related quality of life of PCOS patients in order to improve medication adherence, wellbeing and social functioning of PCOS patients.

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