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 ≥ 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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Received 15 November 2020, Accepted 18 December 2020
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. Approximately 5-10% women are affected by PCOS in fertility ages. PCOS have negative impact on quality of life. Infertility is main cause of decrease quality of life in women age above 25 year. PCOS can also lead to abortion. 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. Hirsutism is main cause of decrease quality of life among women below 25 years of age. On the other hand, infertility is one of the main reason for decreased quality of life in women age above 25 year. The increasing prevalence of depression in PCOS patients has been reported significantly with time. Obesity, body hair, and infertility may decrease self-confidence and create depressive symptoms in patients with PCOS. In addition, changes in hormonal levels may lead to anxiety directly. Insulin resistance is significantly associated with depression in patients with polycystic ovary syndrome patients. Poor body image cause inauspicious consequences on sexual satisfaction of women with PCOS. Acne appearing mostly on face effects the personality of a patient which decreased quality of life. Moreover, outer appearance cause depression in PCOS women.

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. 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. A study reported that nearly 85-90% of women suffer oligomenorrhea 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. 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. Depression was found significantly associated with PCOS women in Pakistan. Depression in PCOS patients was found mainly due to obesity, infertility, hirsutism, menstrual irregularity and insulin.
resistance. Hirsutism was reported in 36.7% of the women with PCOS in Pakistan. While almost 50% of patients with PCOS are obese.

Although, polycystic ovary syndrome is a common endocrine disorder but only 10% of the population is aware of the disease in Pakistan. Out of 51.8% obese women and 22.2% of them who were extremely obese, 55.6% were unaware of polycystic ovary disease. 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/7-no problem). The higher the scores, better the condition. By using confirmatory factor analysis 43 items of PCOSQ show relevant validity and reliability to assess HRQoL. 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 ≥ 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 ≥ 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| 79.13    | 68.61    | 1866.000a  | 114      | 75.88    | 78.37     | 2095.000a  | 0.767     |
|                   | Private=38| 66.70    | 66.70    | 2184.000a  | 77       | 97.60    | 48.04     | 877.500a   | 0.001     |
| Marital status    | Married=77| 80.64    | 67.70    | 1749.500a  | 112      | 60.64    | 99.76     | 25.943b    | 0.002     |
|                   | Single=70 | 72.12    | 88.76    | 1749.500a  | 70       | 97.60    | 48.04     | 877.500a   | 0.001     |
| setting           | Urban=112 | 70.96    | 90.57    | 8.492b     | 84       | 60.64    | 99.76     | 25.943b    | 0.002     |
|                   | Rural=40  | 72.12    | 88.76    | 1749.500a  | 51       | 99.76    | 85.09     | 25.943b    | 0.002     |
| Age of patient    | 15-25=84  | 70.96    | 61.65    | 16.389b    | 6        | 100.75   | 106.98    | 19.350b    | 0.002     |
|                   | 26-35=51  | 90.57    | 79.75    | 16.389b    | 25       | 106.98   | 71.02     | 19.350b    | 0.002     |
|                   | 36-50=17  | 61.65    | 100.75   | 16.389b    | 55       | 85.09    | 71.02     | 19.350b    | 0.002     |
| Level of education| Illiterate=6| 102.30  | 102.30   | 10.583b    | 6        | 22.80    | 21.00     | 5.585b     | 0.238     |
|                   | Primary=25 | 73.54    | 67.44    | 10.583b    | 10       | 21.00    | 18.50     | 5.585b     | 0.238     |
|                   | Secondary=55| 73.54   | 67.44    | 10.583b    | 11       | 18.50    | 9.83      | 5.585b     | 0.238     |
|                   | Master=16  | 58.56    | 58.56    | 10.583b    | 3        | 9.83     | 10.67     | 5.585b     | 0.238     |
| No of children    | 1=10      | 22.65    | 21.00    | 21.00      | 10       | 22.80    | 21.00     | 5.585b     | 0.238     |
|                   | 2=10      | 20.95    | 21.00    | 21.00      | 10       | 21.00    | 18.50     | 5.585b     | 0.238     |
|                   | 3=11      | 21.00    | 21.00    | 21.00      | 11       | 18.50    | 9.83      | 5.585b     | 0.238     |
|                   | 4=3       | 5.00     | 5.00     | 5.00       | 3        | 9.83     | 10.67     | 5.585b     | 0.238     |
|                   | >4=3      | 7.00     | 7.00     | 7.00       | 3        | 10.67    |           |            |            |
| Income            | ≤15,000=46| 90.29    | 73.11    | 7.029b     | 46       | 88.79    | 77.34     | 8.188b     | 0.084     |
|                   | 15001-25,000=32| 73.11 | 68.90    | 7.029b     | 32       | 77.34    | 69.07     | 8.188b     | 0.084     |
|                   | 25,001-35,000=41| 68.90 | 72.40    | 7.029b     | 41       | 69.07    | 62.04     | 8.188b     | 0.084     |
|                   | 35,001-50,000=26| 72.40 | 61.07    | 7.029b     | 26       | 62.04    | 89.07     | 8.188b     | 0.084     |
|                   | ≥50,000=7 | 61.07    |          |           | 7        | 89.07    |           |            |            |
| Work status       | Employed= 33| 72.82    | 81.89    | 2.370b     | 33       | 65.32    | 96.52     | 33.976b    | 0.002     |
|                   | House wife= 76| 72.82   | 69.80    | 2.370b     | 76       | 96.52    | 49.70     | 33.976b    | 0.002     |
|                   | Studying= 43| 72.82    | 69.80    | 2.370b     | 43       | 96.52    |           |            |            |
| Type of comorbidity| None=134 | 72.26    | 94.89    | 5.192b     | 134      | 71.93    | 97.83     | 5.097b     | 0.071     |
|                   | Hypertension=9| 72.26   | 24.25    | 5.192b     | 9        | 71.93    | 32.75     | 5.097b     | 0.071     |
|                   | Other=2    | 72.26    | 94.89    | 5.192b     | 2        | 71.93    | 32.75     | 5.097b     | 0.071     |
| Type of therapy   | Hormonal= 51| 81.91    | 1.165b   | 0.567b     | 51       | 79.58    | 0.727b    | 0.710      |           |
| Demographics       | Body weight   | Infertility | Menstrual |
|--------------------|---------------|-------------|-----------|
| n                  | Mean rank     | Test stats  | P value   | n                  | Mean rank     | Test stats  | P value   |
| Organization       |               |             |           |                    |               |             |           |
| 114/38             | 74.65/82.04   | 1955.5000<sup>a</sup> | 0.369     | 114/38             | 73.80/84.59   | 1858.500<sub>a</sub> | 0.193     |
| Marital status     |               |             |           |                    |               |             |           |
| 77/70              | 101.46/43.79  | 580.500<sup>a</sup> | **0.002** | 77/70              | 104.01/40.99  | 384.000<sub>a</sub> | **0.004** |
| setting            |               |             |           |                    |               |             |           |
| 112/40             | 72.84/86.74   | 1830.500<sup>a</sup> | 0.086     | 112/40             | 71.83/89.56   | 1717.500<sub>a</sub> | **0.027** |
| Age of patient     |               |             |           |                    |               |             |           |
| 84/51/17           | 57.78/103.19/88.94 | 35.496<sup>b</sup> | **0.004** | 84/51/17           | 57.36/102.78/92.21 | 36.509<sup>b</sup> | **0.002** |
| Level of education |               |             |           |                    |               |             |           |
| 6/25/55/49/16      | 103.25/104.24/80.21/63.00/47.00 | 24.772<sup>b</sup> | **0.003** | 6/25/55/49/16      | 99.17/115.16/73.56/60.61/61.63 | 29.933<sup>b</sup> | **0.004** |
| No of children     |               |             |           |                    |               |             |           |
| 10/10/11/3/3       | 17.90/25.20/19.36/6.33/13.33 | 8.500<sup>b</sup> | 0.064     | 10/10/11/3/3       | 18.05/23.40/19.77/10.67/13.00 | 4.530<sup>a</sup> | 0.349     |
| Income             |               |             |           |                    |               |             |           |
| 46/32/41/26/7      | 85.89/68.81/75.55/65.62/95.93 | 6.077<sup>b</sup> | 0.194     | 46/32/41/26/7      | 87.53/70.67/73.70/61.37/103.29 | 9.355<sup>b</sup> | **0.049** |

*Mann-Whitney Test (p ≥ 0.05)<sup>a</sup>, Kruskal Wallis Test (p ≥ 0.05)<sup>b</sup>.*
| Work status     | 33  | 76  | 43  | 40.325<sup>b</sup> | 0.002 | 33  | 76  | 43  | 67.26  | 96.13  | 48.90  | 33.745<sup>b</sup> | 0.004 | 33  | 76  | 43  | 75.06  | 79.04  | 73.12  | 0.547<sup>a</sup> | 0.766  |
|----------------|-----|-----|-----|---------------------|-------|-----|-----|-----|--------|--------|--------|---------------------|-------|-----|-----|-----|--------|--------|--------|-------------|--------|
| Type of comorbidity | 134 | 9   | 2   | 4.286<sup>b</sup>   | 0.109 | 134 | 9   | 2   | 72.37  | 94.44  | 18.75  | 5.761<sup>b</sup>   | 0.040 | 134 | 9   | 2   | 73.20  | 80.28  | 27.00  | 2.696<sup>b</sup> | 0.280  |
| Type of therapy   | 51  | 10  | 91  | 2.759<sup>ba</sup>  | 0.252 | 51  | 10  | 91  | 77.10  | 81.90  | 75.57  | 0.202<sup>b</sup>   | 0.915 | 51  | 10  | 91  | 74.70  | 64.45  | 78.84  | 1.100<sup>b</sup> | 0.589  |
| Thyroid problem   | 3   | 149 | 128.67 | 67.000<sup>a</sup> | 0.037 | 3   | 149 | 112.67 | 75.77  | 115.000 | 0.165 | 3   | 149 | 82.00 | 76.39 | 207.000 | 0.835  |
| Built of patient  | 87  | 37  | 28  | 28.991<sup>b</sup>  | 0.002 | 87  | 37  | 28  | 91.34  | 53.26  | 61.11  | 23.812<sup>a</sup> | 0.003 | 87  | 37  | 28  | 86.44  | 62.30  | 64.39  | 10.489<sup>a</sup> | 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                                                         | 14 (9.2)    |
| A great deal of the time                                                  | 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: 70 (46.1)
- Sometimes: 38 (25)
- Not often: 37 (24.3)
- Very seldom: 40 (26.3)

No significant difference (p ≥ 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 ≥ 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 | Mean rank | Test statistics | P-value |
|--------------------|-----------------|-----------|-----------------|---------|
| Sector             |                 |           |                 |         |
| Public = 114       | 75.29           | 2028.500a | 0.567           |         |
| Private= 38        | 80.12           |           |                 |         |
| Marital status     |                 |           |                 |         |
| Married= 77        | 71.87           | 2531.000a | 0.527           |         |
| Unmarried= 70      | 76.34           |           |                 |         |
| Setting            |                 |           |                 |         |
| Urban= 112         | 72.76           | 1821.000a | 0.03            |         |
| Rural= 40          | 86.98           |           |                 |         |
| Age of patient     |                 |           |                 |         |
| 15-25 = 84         | 72.05           | 3.596b    | 0.166           |         |
| 26-35 = 51         | 85.98           |           |                 |         |
| 36-50 = 17         | 70.03           |           |                 |         |
| Level of education |                 |           |                 |         |
| Illiterate = 6     | 84.67           | 9.534b    | 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           | 7.515b    | 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           | 1.972b    | 0.373           |         |
| House wife = 76    | 74.91           |           |                 |         |
Studying = 43
≤ 15,000 = 46
15,001-25,000 = 32
25,001-35,000 = 41
35,001-50,000 = 26

Income

| Bracket            | Study (%) | 95% CI  | p       |
|--------------------|-----------|---------|---------|
| ≤ 15,000           | 83.41     | 81.31-85.50 | 0.042   |
| 15,001-25,000      | 61.81     | 58.72-64.90 | 0.242   |
| 25,001-35,000      | 64.16     | 60.97-67.35 | 0.633   |
| 35,001-50,000      | 82.29     | 78.91-85.67 | 0.242   |

Type of therapy

| Therapy  | Study (%) | 95% CI  | p      |
|----------|-----------|---------|--------|
| Hormonal | 71.61     | 68.41-74.81 | 0.242   |
| Other    | 97.10     | 95.41-98.80 | 0.431   |
| None     | 76.98     | 74.29-79.67 | 0.431   |

Thyroid problem

| Problem | Study (%) | 95% CI  | p      |
|---------|-----------|---------|--------|
| Yes     | 55.83     | 52.64-59.02 | 0.431   |
| No      | 76.92     | 74.23-79.61 | 0.431   |

Mann Whitney Test a; Kruskal 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.

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. 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. 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.

In PCOS patients the actual reason for the depression is unknown and complex. 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. 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.
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 housewives 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. Higher QoL has been associated with higher education level. 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. 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 than 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. 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.

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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