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IMPACT OF POLYCYSTIC OVARIAN SYNDROME ON QUALITY OF LIFE AMONG STUDENT POPULATION

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ABSTRACT
Poly cystic ovarian syndrome(PCOS) is endocrine disorder of uncertain aetiology and complicated pathophysiology affecting at least 5-10% of female population worldwide. In this study, we aimed to evaluate the impact of PCOS and quality of life of students suffering from PCOS . A cross-sectional study was conducted on 76 students with PCOS using a Polycystic Ovarian Syndrome Quality of Life (PCOSQ) questionnaire to determine the quality of life. In our study the prevalence of PCOS was 21.92 ±4.25 of average age group of 22.3(±2.8) years. Menstrual irregularities had severe negative impact ,while the major domains emotion, body hair, weight gain, and infertility had a moderate impact on the quality of life. A significant association was observed among sleeping habits and infertility problems (p = 0.014), physical activity, weight (p = 0.032), and menstrual problems (p = 0.042).Menstrual problems had a severe impact on the quality of life of students with PCOS. Most of the students had insufficient knowledge and non-compliant to the therapy. An awareness on the symptoms,and impact of PCOS on their cognitive functions need to be educated to improve their quality of life.

Key words. Poly cystic ovarian syndrome, quality of life,endocrine disorder.

INTRODUCTION
Polycystic ovarian syndrome (PCOS) is a complex endocrine and heterogeneous disorder affecting at least 5-10% of female population worldwide . The data on the prevalence of PCOS in India are scarce. According to National Health Portal of India, its prevalence in India is 10% with an incidence of 9.13% in south Indian population [1]. PCOS is a syndrome of uncertain aetiology and complicated pathophysiology with signs of hyperandrogenism , menstrual irregularity with anovulatory infertility. Women with PCOS have chronic inflammation often associated with obesity ,altered hormone profile and insulin resistance leading to endothelial dysfunction, cardiovascular diseases and diabetes [2].
The World Health Organization (WHO) data suggests that approximately 116 million women (3.4%) are affected by PCOS globally . The global prevalence of PCOS varies from 5 to 18%, with an average prevalence of 276•4 cases per 100 000 people in Europe. Around 50% of women are not aware that they have PCOS or they have a delayed diagnosis.[3] .

Quality of life (QOL) is a multidimensional concept that measures a person's wellbeing. Studies on the QoL of individuals allow them to learn about the subjective impact of the disease on the patients' life , the diagnostic and therapeutic interventions to be made for the condition .Our study was designed to assess the impact of PCOS on quality of life among student population using a S-36 questionnaire and quality of life among student population in correlation to age, basal metabolic index.[4]

MATERIALS AND METHOD

Study design and setting

The study was a cross-sectional study conducted in our hospital among the medical ,dental, and para medical students of reproductive age18-45 years who attend the out patient department of Gynecology and who fullfill the Rotterdam criteria 2003 [5]. Subjects with cognitive or developmental disabilities, major illness that influence the HRQOL, diabetes mellitus, abnormal thyroid function, abnormal prolactin levels, confirmed malignancy , breastfeeding women or any serious concomitant illness were excluded.[6].

The QOL of the participants was studied using disease-specific HRQOL questionnaire. The information regarding socio-demographic and disease features (hirsutism, infertility, obesity, and menstrual irregularity) was also collected. Of the 1200 students, 82 were identified with PCOS, and a sampling frame containing 7 6 students was made. The estimated sample size was 75 (with a 5% margin of error, 95% confidence interval. However, 76 students expressed their willingness to participate in the study. The study was approved by the Institutional Ethical Committee and

after getting informed consent , using a confidential pre-validated questionnaires detailed history and anthropometric data was recorded. Pre-validated SF-36 was used to assess the quality of life. The scores for each domain range from 0–100, where higher scores indicate better condition. The SF-36 questionnaire can provide a direct quantitative indication of an individual's health status and, as it is easy to administer, it has become the most widely-used QOL evaluation tool in the world [7] .It reflect 8 domains of health; which includes limitations in physical activities because of health problems,Limitations in social activities because of physical or emotional problems, Limitations in usual role activities because of physical health problems, Bodily pain, General mental health (psychological distress and well-being), Limitations in usual role activities because of emotional problems , Vitality (energy and fatigue), General health perceptions. It stems from a study called the Medical Outcomes Study for the objective measure of the quality of life.[8]

STATISTICAL ANALYSIS

Frequencies and percentages were reported for qualitative data. The Mann–Whitney test was used to determine the association between variables and domains of the questionnaire. The Kruskal–Wallis test was used to find the association between variables (with ≥ three groups) and domains of the questionnaire. The level of significance was considered at $p < 0.05$. Jeffrey's Amazing Statistical Program (version 0.12.1) software was used for statistical analysis.

RESULT AND DISCUSSION

Polycystic ovary syndrome (PCOS) affects about 5 to 10% of females who are of reproductive age. Typical PCOS women show acanthosis nigricans, raising the possibility that they were insulin resistant. Hyperandrogenism occurs in 80 to 85% of the patients with PCOS, and manifests as hirsutism, obesity, acne, seborrhea, alopecia, and virilization.

The clinical feature including obesity, hyperandrogenism, PCOS-related complications and depression can lower self-esteem and have a negative impact on the quality of life of these patients, though they are not systematically coped [9]. PCOS subjets are concerned about their weight and their appearance and health has not been appreciated [10]. These factors might be the risk factors of depression and high anxiety scores. However, their management seems to improve the quality of life of these patients even if it remains inferior to the control groups .A change in lifestyle may be considered the first line of treatment for women with PCOS as a nonpharmacological treatment.

Table 1 illustrates the sociodemographic details of the patients. In our study 76 women suffering from PCOS participated in our questionnaire survey. The mean age of the participants was 21.92 ±4.25 years. Most of the students were graduates (89 %)and 11% were post graduates in qualification Around 96.1%, had no comorbidities .16% of the participants used different medications for pcod and84% did not use complementary alternate medications . The mean duration of the disorder was 6.01 ±2.23, and the average weight was 47.6 ±10.39 kg. Mild and no sleep disturbances constituted 66%. Half of them reported no other problems.

TABLE 1. Sociodemographic characteristics of the students with polycystic ovarian syndrome (N = 76)

CHARACTERISTICS	FREQUENCY	PERCENTAGE(%)
Age in years		
18–21	50	65.7
22–25	26	34.3
Education		
Graduation	67	89
Post graduation	9	11
Duration of PCOD in years		
2-4	12	16
4-8	59	79
>8	05	6.5
Comorbidities		
Yes	03	3.9
No	73	96.1
Physical activity		
Yes	68	89.5
No	08	13.5
Sleeping habits		
Mild	08	10.5
moderate	10	13.3
Severe	03	39
None	45	59.2
Medications		
yes	12	16
no	64	84
Other problems		
Acne	12	16
pigmentation	3	2.6
Migraine	0	0
Blemishes	0	0

TABLE 2. Mean scores of the domains of the PCOSQ questionnaire

Name of the domain	Mean ± SD
Emotion	62.5 ± 30.71
Weight	48.5 ± 8.92
Limitation due to physical health	56.25± 38.3
General health	50.17 ±12.21
Infertility problems	6 out of 76 subjects

TABLE 3. Association of socio demographic variables with the domains of the PCOSQ questionnaire

Name of the variable	Emotion (p)	Limitation due to physical health (p)	Weight (p)
Duration	0.005	0.026	0.478
Age	0.216	0.15	0.317
Comorbidities	0.371	0.265	0.473
Sleeping habits	0.676	0.115	0.563
Physical Activity	0.328	0.02	0.233

4. Knowledge and practices of students toward the disease

S. No.	Knowledge and practices	Frequency (%)
1	Negligence toward symptoms	52 (68.4%)
2	Nonadherence	32 (42.1%)
3	Noncompliant	62 (81.5%)
4	Insufficient knowledge on disease	29 (38.1%)
5	Insufficient knowledge on management	33 (43.4 %)

In our study, emotions, weight and infertility problems moderately affect students' health-related quality of life (HRQoL). Menstrual problems had severe impact on students' HRQoL.
The mean score of the domains were physical function 63.39 ± 26.9, Emotion 62.5 ± 30.71,weight 48.5±8.92,limitation due to physical health 56.25±38.3, emotional well being 52.05 ± 9.4 and general health was 50.17 ±12.2.Among the study population 6 women out of 76 complained of Infertility problems related to PCOS.
Mugada, *et al*. in their study reported menstrual problems as domains that had severe impact on the quality of life of women with PCOS. The study proves that menstrual problems affected the quality of life of students.

Physical activity :Physical activity is an important part of managing PCOS. It can improve symptoms and reduce the risk of developing long-term health conditions, such as type 2 diabetes and cardiovascular disease.[11]
For women with PCOS, there are many benefits of regular physical activity, which includes increased energy levels and fitness ,weight loss and maintenance,improved self-confidence and motivation, improved emotional wellbeing,reduced androgen production and insulin resistance,improved menstrual cycle regularity and improved fertility.
Physical activity includes walking every day for 30 minutes and increase this over time. A combination of cardio exercise and muscle strength activity may improve the fitness of the body.

Emotion and emotional well being : Women with PCOS often report signs of mood swings, depression and anxiety. Mood swings can feel like rapidly fluctuating emotions that can manifest as irritability, temper, sadness and/or anxiety that results from hormonal imbalance.[12,13] Many women do experience signs of mood swings, especially near their menstrual cycle.In PCOS cases, physical, social and emotional well-being more affected as evidenced from all eight domains of SF-36 indicating strongly compromised HRQOL.
Consistent with the previous report, increasing the age had a more negative impact on different domains of SF-36 in PCOS cases. Comparable scores in PCOS women with increasing age for physical health, energy and emotional well-being may be due to improved regular menses with age concurrent to improved PCOS features and loss of societal fear. [14]
The emotional well being can be improved by controlling the anxiety and stress by nutritional suppliments ,exercise, adequate sleep and cognitive behavioural therapy which has an impact on our physical health and also our emotions. Complex carbohydrates, protein, fruits, vegetables, nuts

and seeds may help the person to keep blood sugar levels stable with a stable emotional status.Regular exercise maintains blood sugar levels, which is critically important for improving our mood, and to maintain weight. Che *et al* in their review states that healthy lifestyle behaviors, healthy eating, and regular physical activity can improve health and well-being of PCOS women throughout life by maintaining hormonal outcomes and quality of life.[15] The study focus on the need for dietary management under proper guidance to recognize the role of diet and lifestyle factors in the disorder. N Scannell *et al* has identified a wide range of nutraceuticals and micronutrient supplements essential for reproductive and metabolic dysfunction in women with PCOS.

Exercise helps to reduce stress and release endorphins to maintain an emotional balance, relief from negative thoughts and help to improve social interaction. A detailed review on impact of exercise in PCOS women showed that exercise helps in the improvement in health-related quality of life. Exercise also proved benefit for improving symptoms of common mental health concerns with improvement in depression and anxiety related issues. Studies indicate that poor sleep can produce a 50 % increase in insulin resistance within just a few days[16]. A woman with PCOS will experience a 50 % rise in blood glucose levels, despite following a healthy diet, Hence, practising sleep hygiene such as going to bed and waking up at a fixed time, putting out devices before sleeping, practising relaxation techniques can reuSe the emotional disturbances in PCOS women.

Sleep disturbance and its consequence were studied in detail by Renac FC *et al* and observed PCOS as a condition of severe metabolic stress that cascades into oxidative and emotional stress. Multidimensional treatment to improve sleep can mend metabolic function and might possibly prevent long-term cardiometabolic sequelae for them.[17]

Cognitive Behavioural Therapy (CBT) can help to identify emotional health issues ,to overcome negative thought patterns and to practice modified life pattern . International evidence-based guidelines for PCOS also recommend this behavioural therapy to improve the quality of life .

Barnard *et al* in 2007 in their study on a large population of PCOS women refines the understanding of depression and QoL in PCOS and demonstrates the need to regularly review the psychological health of women with PCOS.[18]

Limitation due to physical health

Women with PCOS are found to have insulin resistance (IR) and hyper insulinemia, which can leads to metabolic syndrome and other comorbidities .The synergetic actions of metabolic syndrome and PCOS affect hepatic functions and glucose production to cause insulin resistance and Type IIdiabetes mellitus .

In this study the duration of the disease had significant correlation with the limitation in their routine physical activities($p=0.026$) .International PCOS guidelines suggest moderate physical activity for 150 min per week and vigorous activity for 75 min per week for normal-weight women with PCOS. It has been suggested that obese women with PCOS should engage in moderate activity for 250 min per week and vigorous activity for 150 min per week, or an equivalent combination of both to obtain reproductive health benefits . 17

Previous studies shows that regular physical activity has also been found to improve glycaemic control, metabolic functions, and quality of life among women with PCOS .[19]

Chris Kite *et al* in 2024 have noticed poorer HRQoL by women with PCOS and highlights self-esteem as a key factor in the promotion of health in this population. A PCOS diagnosis was also noted to have a greater impact upon mental health than on physical health, with both domains being impaired in women with PCOS. This study highlights a need for future studies, preferably using device-measured physical activities, to better understand the health-related impact of physical activities as well as the potential role of physical activities in the promotion of self-esteem in women with PCOS.[20]

Negligence toward symptoms

In our study 68.4% were negligent towards the symptoms what they experience in their life. PCOS can become a serious issue if left untreated. All of the symptoms they experience can lead to other health risks such as cancer, acne scars, type 2 diabetes, high blood pressure, problems with the heart and blood vessels, and uterine cancer if non proper treatment is taken. Other health issues that may arise include sleep apnea and difficulty in conceiving.[21]Noncompliant group of participants were 81.5%. The students who were on treatment reported a relief in the symptoms. Most of our study subjects were students and their busy academic schedule and lack of time may be the reason for non complaint group of women with PCOS. We provided awareness about the PCOS and its consequences by sending a power point presentation and useful digital resources.

Insufficient knowledge on disease

In our study we found that the knowledge and practices toward the disease of our study subjects were minimal. In our study 38.1% of the population had Insufficient knowledge on the etiology and consequence of PCOS .while 43.4 % had insufficient knowledge on management of the disease. Most of the students have insufficient knowledge and non-compliant to the therapy.

Few studies reported that hirsutism had a negative influence on different dimensions of the quality of life of women and adolescents.[22]]

A study on the QoL of Iranian women with PCOS have seems to be affected more by the severity of hirsutism, as compared to other PCOS symptoms.Hence they suggest that Practitioners should consider that the QoL for women of diverse ethnic backgrounds is affected differently by the various symptoms of PCOS, and that these differences should be taken into account when prioritizing treatment planning and counseling.[23]

Awareness about PCOS management is a potential tool that may improve quality of life. Simple lifestyle modifications such as weight management and regular physical activity can significantly improve quality of life. With physical activity, we can control obesity, which contributes many diseases. At present, we can use websites that provide proper management strategies for PCOS. Therefore, we should provide counseling for every student with PCOS. To create awareness about the PCOS clinical condition ,its impact on the subjects and burden and limitation it induce in their routine physical activities should be focussed and encourage them for life style modification. [24]With physical activity, we can control obesity, which contributes many diseases. PCOS women can be made aware of websites that provide proper management strategies for PCOS. Hence proper counselling and evidence-based information on PCOS should be provided for every women with PCOS. We can provide resources such as websites and smartphone applications to provide awareness and improve PCOS.

In our study ,the students were within the age of 18 to 25 years and hence no significant change was observed in the quality of life among them .Our study subjects were unmarried ,but they had limitation in their physical health ($p<0.001$), had emotional issues due to physical appearance and irregular menstrual cycles and sleep disturbance with $p<0.010$. The study has a few limitations. As it a survey on quality of life we could not calculate their body mass index. Our study subjects were those already suffering from PCOS. We assessed awareness with open-ended questions only because our aim was to strengthen their awareness of the disease and management aspects.

Complete knowledge of the PCOS and counseling for adolescents should be included in the curriculum to provide awareness toward the disorder and lifestyle modification. The course structure should also include conducting awareness programs on noncommunicable diseases that commonly occur among the community members. It will help them comprehensively understand the disease and responsibility toward the society.

The study has a few limitations. We included students who are already suffering from PCOS. We assessed awareness with open-ended questions only because we decided to strengthen their awareness of the disease and management aspects. The study results cannot be generalized to the whole population because of the small sample size.

CONCLUSIONS

In our study, menstrual problems affected the quality of life of students. Most of the students have insufficient knowledge and non-compliant to the therapy. Therefore, modifying curriculum is necessary to enhance knowledge of PCOS and lifestyle modifications.

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