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Quality of Life of Women with PCOS through Stress Management and Lifestyle Intervention

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Abstract

Polycystic Ovarian Syndrome (PCOS) is the major endocrine disorder among young women of reproductive age and characterized by increased body weight, menstrual irregularity, and infertility affecting their quality of life. Despite tremendous advances in the management of reproductive dysfunction, insight into the psychological management of PCOS is limited. Therefore, the preset study examined the impact of stress management and lifestyle interventions on PCOS related quality of life. Women diagnosed with PCOS (N = 25) in their reproductive age of 18-30 years (M = 23.72, SD = 2.53) were asked to respond on Polycystic Ovarian Syndrome Quality of Life Questionnaire (Williams & Knibb, 2018) before and after the implementation of an intervention comprising of four weeks. The results indicated satisfactory psychometric properties of the scale along with significant differences in PCOS related quality of life after the intervention. Moreover, significant differences were apparent for PCOS related quality of life across marital status of women in both pre and post intervention. These findings showcased that stress management and lifestyle interventions could be an important approach to assist practitioners in provision of self-management plan for females diagnosed with PCOS.

Keywords: *Polycystic Ovarian Syndrome (PCOS), stress management, lifestyle intervention, PCOS related quality of life*

Introduction

Polycystic Ovarian Syndrome (PCOS) is the most prevalent metabolic and endocrinal disorder affecting 4% to 8% women of reproductive age which results in reproductive, metabolic, and psychological dysfunction (Dennett & Simon, 2015; Teede et al., 2018). In Pakistan, the

predominant reliance on herbal treatments due to their perceived affordability intensifies the issues of misdiagnosis and inappropriate management practices for various health conditions (Khan & Hussain, 2020). This practice is particularly problematic for PCOS, where cultural taboos surrounding infertility and reproductive health, coupled with limited support and awareness, discourage women from seeking proper medical consultation (Nazir et al., 2021). The unique socio-cultural context of Pakistan further complicates the management of PCOS symptoms, contributing to a deterioration in the quality of life for affected women who are unable to access appropriate healthcare resources (Rizvi et al., 2023). Consequently, there is a critical gap in understanding how these contextual factors impact the mental health and overall well-being of women with PCOS in Pakistan, thereby highlighting the urgent need for targeted research in this area (Haider & Sadiq, 2019). Moreover, existing research predominantly focuses on medicinal approaches to treat PCOS, which are often prohibitively expensive for individuals in developing countries like Pakistan (Haider & Sadiq, 2019). Therefore, investigating cost-effective self-management strategies tailored to the Pakistani context is crucial to improving health outcomes and quality of life for women affected by PCOS in similar resource-constrained settings globally.

Women with PCOS exhibit diverse symptoms such as infertility, hirsutism, obesity, acne, and irregular menstruation (Stegmann, 2011; Eggers & Kirchengast, 2001; Witchel et al., 2019; Ndefo et al., 2013). These distressing symptoms (Kitzinger & Willmott, 2002) compromised the quality of life of women (Fatameh et al., 202; Fugal et al., 2022; Karjuls et al., 202; Greenwood et al., 2018; Sidra et al., 2019) with increased psychological concerns (Alur-Gupta et al., 2019; Amini et al., 2014; Ethirajulu et al., 202; Kumarapeli et al., 2011) inclduing stress

(Salleh, 2008) and depression (Adali et al., 2008). Although, there are several medicines that target PCOS symptoms separately, yet it is difficult to manage PCOS. Although, complementary and alternative medicine can provide support to traditional treatments (Jia et al., 2021; Kwon et al., 2018). However, standardized treatment remains lacking (Johnson, 2014). Lifestyle changes, such as exercise and weight loss, are recommended for adolescent PCOS patients to regulate menstruation and androgen levels. Yet, implementing lifestyle modifications is challenging due to limited awareness of dietary impacts and insufficient knowledge about PCOS (Rao et al., 2020). Additionally, women with this condition face challenges in adopting healthy lifestyle changes due to hormonal imbalances (Ee et al., 2021). Therefore, the study aimed to assess the effectiveness of self-management plan to improve quality of life of women diagnosed with PCOS.

Stress can exacerbate the hormonal imbalance; characteristic of PCOS, thereby intensifying symptoms such as acne hirsutism and weight gain (Rasgon & Kenna, 2005; Saslow & Aikens, 2020). This establishes a vicious cycle wherein stress and PCOS symptoms mutually reinforce each other, complicating the management of the condition (Dokras, 2016). Hence, women with PCOS are at a heightened risk for developing depression and anxiety disorders compared to the general population (Barry et al., 2011). Additionally, stigmatization and societal pressures regarding body image and fertility can precipitate feelings of inadequacy and low self-esteem (Kitzinger & Willmott, 2002) among women diagnosed with PCOS. These social stressors further augment the psychological burden of PCOS, leading to social withdrawal and reduced participation in daily activities (Himelein & Thatcher, 2006). Consequently, addressing these stressors is vital through effective stress management. As this is integral to alleviate both physiological and

psychological symptoms of PCOS, thereby improving overall quality of life for those affected.

Stress management techniques play a crucial role in promoting overall well-being and coping with the challenges of life (Anshel, 2000). Acknowledging stress as a natural response is essential to employ effective strategies to mitigate its negative impacts. Diet and exercise contribute significantly to stress reduction, with a balanced diet and regular physical activity aiding in cell recovery and cortisol regulation (Bremner et al., 2020). Additionally, regular physical exercise has been shown to release endorphins, which improve mood and reduce perceived stress (Herring, 2010). Similarly, meditation techniques, including focused attention and deep breathing, induce relaxation responses that counteract stress effects on the body and mind (Toussaint et al., 2021). Mindfulness meditation has been found to reduce symptoms associated with anxiety and depression by fostering a non-judgmental awareness of the present moment (Goyal et al., 2014) and enhances quality of life in PCOS-affected women (Stefanaki et al., 2015). Progressive Muscle Relaxation (PMR) and visualization/guided imagery are additional techniques utilized to alleviate stress and promote relaxation (Norelli et al., 2021). PMR involves systematically tensing and releasing muscle groups to reduce tension, while guided imagery focuses on creating mental images of peaceful environments to induce relaxation (Khir et al., 2024). These stress management practices not only enhance physical and mental health but also contribute to a higher quality of life by fostering resilience and coping among individual's (Ozbay et al., 2007). Integrating a variety of stress management techniques into daily life can lead to more effective and sustainable stress reduction, ultimately promoting long-term well-being and mental health (Baum et al., 1993).

Lifestyle management have been demonstrated to enhance mood

and alleviate depression symptoms in overweight and obese women without PCOS (Thomson et al., 2010). Similarly, lifestyle modifications in obese PCOS patients lead to improvements in PCOS related symptoms (Lim et al., 2019). Lifestyle interventions incorporate a combination of dietary modifications (Teede et al., 2011), physical activity (Harrison et al., 201), and behavioral therapy (Moran et al., 2011) to manage and prevent metabolic illnesses associated with obesity, including type 2 diabetes (Ozbay et al., 2007) and promote healthy behaviors (Bradley et al., 2022).. As these interventions aid anovulatory obese women in resuming ovulation primarily by improving insulin sensitivity. By adopting a balanced, calorie-restricted diet and engaging in moderate exercise, women with PCOS can achieve weight loss, improved menstrual cyclicity, and reduced risk factors for type 2 diabetes and cardiovascular disease (Cowan et al., 2023; Nho, 2017). These behavioral modifications (regular exercise, balanced diet, and stress reduction methods) need to be implemented from a very young age to lessen the burden of PCOS. However, lifestyle influences, such as weight management challenges, eating disorders, exhaustion, and sleep disturbances, continue to impact the overall quality of life (Mutti et al., 2023).

In addition to lifestyle modifications, herbal remedies have shown promise in managing PCOS symptoms effectively (Balkrishna et al., 2023). Flax seeds, rich in fiber and omega-3 fatty acids, have been linked to improved menstrual cycles and reduced ovarian cysts in PCOS-affected women (Haidari et al., 2020). Similarly, fenugreek and cinnamon have demonstrated benefits in improving menstrual regularity and reducing infertility in PCOS patients (Lakshmi et al., 2023). Additionally, carom seeds (*ajwain*) and black seed oil have been investigated for their anti-inflammatory and weight-loss properties,

potentially aiding in PCOS management (Khani et al., 2021). Furthermore, liquorice has been found to alleviate PCOS symptoms such as hirsutism and hyperandrogenism by reducing testosterone levels and inhibiting androgen production (Lakshmi et al., 2023). These herbal remedies offer promising alternatives or supplements to traditional treatments for PCOS, contributing to improved symptom management and overall well-being (Arentz et al., 2014).

Accordingly, this study aims to assess the effectiveness of culturally sensitive and economically feasible approaches to manage PCOS through stress management and lifestyle modifications among women diagnosed with PCOS. By integrating local beliefs and practices into healthcare strategies, the study focusses on enhancing the acceptability and effectiveness of interventions aimed at empowering women with PCOS to manage their condition effectively (Rizvi et al., 2023). Therefore, the study hypothesize that women will have better PCOS related quality of life after the intervention.

This approach not only promotes self-reliance and autonomy but also contributes to the broader discourse on healthcare equity and access in developing countries. By conducting comprehensive research in this area, the study contributes to generate evidence-based recommendations that inform policy makers and healthcare providers about the specific needs of women with PCOS in Pakistan. Ultimately, this research seeks to foster a more inclusive and responsive healthcare system that supports the well-being and reproductive health rights of all women, regardless of socio-economic status or cultural background (Teede et al., 2018).

METHOD

Research Design and Sample

The present study implemented single-subject ABA design to access the efficacy of stress management and lifestyle intervention on

women diagnosed with PCOS (N = 25) with age range of 18-30 years (M = 23.72, SD = 2.53) in a pre and posttest settings. Both married (n = 11) and unmarried women (n = 14) who were studying in a university were taken in the study. Intervention was employed for four weeks, comprising of eight sessions (two sessions per week). Pretest and post-test evaluations were conducted and the difference in the outcome was analyzed.

Instruments

Polycystic Ovarian Syndrome Quality of Life Scale (PCOSQoL)

The scale, developed by Williams et al. (2018) assesses impact of polycystic ovarian syndrome on women`s health related quality of life. It consists of 35-items distributed across four subscales: impact of PCOS (16-items), Infertility (7-items), Hirsutism (6-items) and Mood symptoms (6-items). Each item is rated on a 7-point Likert scale ranging from 1 (usually) to 7 (does not apply) with no reverse coded items. Higher scores indicated a greater impact of PCOS on quality of life.

Lifestyle Intervention

In this study, participants were encouraged to adhere to specific dietary guidelines (prepared after consulting the nutritionist and gynecologist) emphasizing usage of high- quality fats, high protein food, low-cholesterol food, less quantity of sugar, lower level of caffeine related products and excessive use of liquids including liquorice and green tea to manage their PCOS and enhance their PCOS related quality of life. Additionally, participants were instructed to prioritize sleep hygiene and regulate their sleep pattern to address sleep disturbance which could affect the research outcomes.

Stress Management

Stress management techniques, essential for addressing stressful situations, encompass a wide range of methods such as relaxation

exercises, anticipation of stress reactions and breathing exercises (APA Dictionary of Psychology, 2022). In this research specific stress management techniques were incorporated under the guidance of a Clinical Psychologist, including activity chart, Progressive Muscle Relaxation Therapy (PMRT), deep breathing, and guided imagery. PMRT, developed by Jacobson (1920) focused on systematically tensing and relaxing group of muscles to induce physical and mental relaxation (Nwokolo et al., 2017). Deep breathing reduces stress by decreasing oxygen consumption and heart rate while increasing parasympathetic activity (Chiang et al., 2009). Guided imagery involves envisioning pleasant scenes or events to alleviate stress (Nunez, 2022). Activity chart, also known as behavioral activation, aims to restore daily routines and enjoyment through planned engagement in activity. These techniques offer comprehensive strategies to manage stress and enhance well-being.

Procedure

After taking ethical approval from Riphah International University prior to data collection, participants were approached in different universities of twin cities (Rawalpindi and Islamabad). The study ensured participant`s informed consent, confidentiality, and the right to withdraw. Participants were explained thoroughly about the research procedure including their access to professional support for any psychological concerns. They were assured that the study would be instructive, and no one would be harmed. Data was collected in pretest using demographic sheet and PCOSQoL scale.

Intervention plan

Following pretest, where participants filled PCOSQoL scale, participants underwent a four-week intervention comprising of eight sessions. Time allotted for each session was forty-five minutes. Week one commenced with two sessions focusing on research debriefing,

pretest, rapport building, and counselling. Rapport was built with active listening and empathy and finally concluded with a pretest of participant`s PCOS related quality of life. The second session of first week initiated the intervention with motivational counseling for adherence, followed by behavior analysis, making activity chart, and diet plan discussion. Participants were instructed about the diet plan which was to be followed throughout four weeks intervention.

Stress management techniques were introduced in the second week (third session) in two sessions with guided imagery, deep breathing, and PMRT followed by feedback sessions proceeding each. The focus of the session was deep breathing and guided imagery to achieve desired relaxation effects. Motivational interviewing was provided in the final ten minutes to reinforce adherence to the intervention guidelines. During the fourth session, PMRT was employed following the practices done in the previous session.

Week three (fifth and sixth session) mirrored week two (third and fourth session), with participants engaging in stress management activities, followed by feedback and PMRT practice. Week four (last two sessions) integrated post-test and stress management including deep breathing, guided imagery and PMRT across two sessions followed by participant's feedback. Participants completed PCOSQoL as post-intervention evaluation and feedback forms were distributed among them for additional comments and recommendations.

RESULTS

All responses were recorded and analyzed using SPSS-26 to evaluate the intervention`s effectiveness. Most of the women diagnosed with PCOS were doing postgraduation, unemployed, single, and belonged to nuclear families. Majority of them reported relationship issues as stressors. Two-

thirds were diagnosed through ultrasound and most of them were diagnosed within recent six month.

Cronbach`s alpha reliability of PCOSQoL and its subscales ranged from *a* = .70 to *a* = .90 in both pre and post intervention. Moreover, the results illustrated normal distribution of data within normal range of skewness and kurtosis. Details are mentioned in Table 1.

Table 1

Psychometric Properties of PCOS related Quality of Life in Pretest and Post-test (N = 25)

					Range			
Variables	*k*	*a*	*M*	*SD*	Potential	Actual	Skewness	Kurtosis
Pretest Polycystic Ovary Syndrome Quality of Life Questionnaire								
Impact of PCOS	16	.87	47.36	16.74	16-112	21-77	.25	-.85
Infertility	07	.94	35.52	12.76	7-49	13-49	-.87	-.93
Hirsutism	06	.94	23.8	11.51	6-42	6-42	.06	-1.21
Mood Items	06	.70	9.28	3.95	6-42	6-20	1.40	1.38
Total PCOSQoL	35	.77	115.9	21.83	35-245	85-152	-.02	-1.28
Post-test Polycystic Ovary Syndrome Quality of Life Questionnaire								
Impact of PCOS	16	.89	83.76	14.52	16-112	57-104	-.36	-1.11
Infertility	07	.94	40.52	8.79	7-49	18-49	-1.28	.99
Hirsutism	06	.92	32.4	7.984	6-42	15-42	-.58	-.33
Mood Items	06	.78	29.72	4.774	6-42	23-41	.83	.171
Total PCOSQoL	35	.92	186.4	26.42	35-245	117-222	-1.16	1.05

After psychometric properties, group comparisons of pretest and post-test was carried out for demographic variables. The results are displayed in Table 2 and Table 3.

Table 2

PCOS related Quality of Life in Pretest & Post-test of the Study (N = 25)

	Pretest	Post test			*CI (95%)*		*Cohen`s*
Variables	*M (SD)*	*M (SD)*	$t_{(24)}$	*p*	*LL*	*UL*	*d*
Impact of PCOS	47.36 (16.74)	83.76 (14.52)	8.45	.000	-45.29	-27.51	2.32
Infertility	35.52 (12.76)	40.52 (8.79)	3.15	.004	-8.28	-1.72	.46
Hirsutism	23.8 (11.51)	32.4 (7.98)	4.962	.000	-12.18	-5.02	.89
Mood Items	9.28(3.95)	29.72 (4.77)	15.36	.000	-23.19	-17.70	4.67
Total PCOSQoL	115.96 (21.8)	186.4 (26.42)	11.10	.000	-83.54	-57.34	2.91

The findings indicated significant improvement in participants PCOS related quality of life following the intervention.

Table 3

PCOS related Quality of Life among Unmarried (n = 14) & Married Women (n = 11) in Pretest & Post-test of the Study

	Unmarried	Married			*CI (95%)*		*Cohen`s*
Variables	*M (SD)*	*M (SD)*	$t_{(23)}$	*p*	*LL*	*UL*	*d*
Pretest Polycystic Ovarian Syndrome Quality of Life Questionnaire							
Impact of PCOS	49.7 (11.6)	44.4 (21.87)	.79	.44	-8.7	19.4	.303
Infertility	41.36 (6.3)	28.09 (15.2)	2.97	.01	4.02	22.5	1.14
Hirsutism	22.71 (11.95)	25.18 (11.3)	-.52	.61	-12.2	7.28	.21

Mood Items	10.79 (4.56)	7.36 (1.80)	2.34	.03	.40	6.45	.99
Total PCOSQoL	124.5 (21.32)	105 (17.79)	2.45	.02	3.02	36.1	1.00
Post-test Polycystic Ovarian Syndrome Quality of Life Questionnaire							
Impact of PCOS	89.14 (11.26)	76.9 (15.78)	2.26	.03	1.05	23.4	.89
Infertility	44.79 (3.76)	35.1 (10.44)	3.23	.00	3.49	65.9	1.24
Hirsutism	33.93 (5.95)	30.45 (9.97)	1.08	.29	- 3.16	10.1	.42
Mood Items	29.57 (4.89)	29.91 (4.84)	-.17	.87	- 4.40	3.73	.07
Total PCOSQoL	197.43 (13.69)	172.36 (32.31)	2.62	.02	5.34	44.78	1.01

These findings illustrated significant differences in overall PCOS related quality of life of unmarried women in both pre and post intervention. However, the mean of overall PCOS related quality of life indicates an increase after the intervention for both single and married women.

DISCUSSIONS

More than half of women with PCOS today are leading stressful and competitive life. However, there isn`t universal treatment than can alleviate all the symptoms of PCOS (Mason et al., 2011). Therefore, the study aimed to design and implement stress management and lifestyle intervention to improve quality of life of women diagnosed with PCOS.

The results illustrated significant impact of intervention on PCOS related quality of life among women with PCOS. The analysis provided

evidence for the effectiveness of the intervention consistent with the previous literature (Young et al., 2021; Abdollahi et al., 2018; Raja-Khan et al., 2017 & Stefanaki et al., 2014). Lifestyle interventions including dietary modifications, physical activity and stress management were associated with improvements in metabolic parameters, hormonal imbalance, and menstrual irregularity in women with PCOS (Lim et al., 2019; Teede et al., 2019). These interventions not only address the physiological manifestation of PCOS but also have profound impact on quality of life of women with PCOS (Cowan et al., 2023). Stress management techniques including mindfulness promotes emotional well-being (Jiskoot et al., 2022; Lucas et al., 2017; Phimphasone-Brady et al., 2022; Tang et al., 2022; Teede et al., 2018) and resilience (Dybciak et al., 2022), enabling women with PCOS to cope more effectively with the challenges associated with their condition thereby alleviating their quality of life.

Implications and Suggestions

Indigenous stress management and lifestyle interventions programs could be helpful in raising awareness for PCOS and its self-management and could further aid practitioners in refining their management plans for PCOS. This cost-effective and self-management plan do not require extensive training and therefore can potentially alleviate the financial burden for women. The findings can assist in raising awareness among reproductive-aged women, helping them recognize their symptoms and lower the risk of developing PCOS through lifestyle interventions and stress management.

Participants of the study provided valuable feedback and suggestions for improving the stress management plan and lifestyle interventions for women with PCOS. They recommended rotating stress management techniques periodically to maintain engagement and prevent

monotony. Additionally, they emphasized the need for a comprehensive and accessible diet plan and suggested a simple the diet plan to include only a few herbal medicines. Surprisingly, a couple of participants proposed extending the duration of practice sessions and increasing the frequency to daily sessions to enable them to track their progress more effectively. These insights from participants underscore the importance of tailoring interventions to meet the diverse needs and preferences of individuals with PCOS, ultimately enhancing the effectiveness and sustainability of self-management strategies.

Conclusion

To conclude, the findings of the present study emphasized the significance of stress management and lifestyle modifications in enhancing health-related quality of life for women diagnosed with PCOS. By demonstrating the effectiveness of self-management interventions, this research challenges the misconception that PCOS cannot be managed by individuals themselves, thus contributing to breaking the taboo surrounding this condition. The study highlights the role of healthcare practitioners, academicians, and social workers in promoting awareness about self-management strategies tailored to PCOS symptoms. Furthermore, the results suggest avenues for future research to expand intervention frameworks for different PCOS phenotypes. Overall, the study emphasizes the importance of dietary modifications, lifestyle changes, and stress management in empowering women with PCOS to improve their emotional, psychological, and physical well-being, ultimately enhancing their quality of life.

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