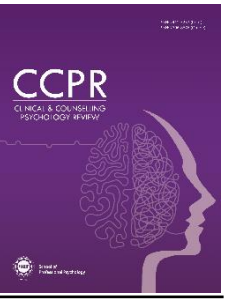
Clinical & Counselling Psychology Review (CCPR)
Volume 7 Issue 1, Spring 2025
ISSN$_{(P)}$: 2412-5253, ISSN$_{(E)}$: 2706-8676
Homepage: https://journals.umt.edu.pk/index.php/CCPR



Article QR

Title:	**Cognitive Difficulties, Mental Fatigue and Psychological Well-being of Women with Polycystic Ovary Syndrome**
Author (s):	Haieqa Zahid and Aiman Javed
Affiliation (s):	King Edward Medical University, Lahore, Pakistan
DOI:	https://doi.org/10.32350/ccpr.71.06
History	Received: January 11, 2025, Revised: May 25, 2025, Accepted: May 30, 2025, Published: June 30, 2025
Citation:	Zahid, H., & Javed, A. (2025). Cognitive difficulties, mental fatigue and psychological well-being of women with polycystic ovary syndrome. *Clinical and Counselling Psychology Review*, *7*(1), 117–140. https://doi.org/10.32350/ccpr.71.06
Copyright:	
Licensing:	
Conflict of Interest:	Author(s) declared no conflict of interest

A publication of
Department of Clinical Psychology
University of Management and Technology, Lahore, Pakistan

Cognitive Difficulties, Mental Fatigue and Psychological Well-being of Women with Polycystic Ovary Syndrome

Haieqa Zahid* and Aiman Javed

Department of Psychiatry and Behavioral Sciences, King Edward Medical University, Lahore, Pakistan

Abstract

Polycystic ovary syndrome (PCOS) is a common health issue in 52 percent of Pakistani women and linked with cognitive impairments and mental fatigue, but its psychological consequences have not been studied in-depth. This research seeks to investigate the connection between cognitive difficulties, mental fatigue and psychological wellbeing among PCOS women, to gain more insight into the psychological effect of the syndrome, and to guide its interventions that could improve their psychological health. A sample of 60 women aged 18-45 years was selected out of PCOS diagnosed women in both the private and public hospitals in Punjab, Pakistan. The research tools used in the study were as follows; Demographic Questionnaire, Cognitive Failure Questionnaire, Mental Fatigue Scale and Ryff's Psychological Well Being Urdu Scale. The correlational analysis found that, both mental fatigue and cognitive difficulties had negative correlations with psychological well-being. Regression analysis also indicated that poor psychological wellbeing among the PCOS women was largely predicted by mental fatigue. In this study, it is demonstrated that lower degree of psychological wellbeing is related to the presence of cognitive difficulties and mental fatigue in women with PCOS, and such a result is predicted by mental fatigue to the greatest extent.

***Keywords*:** cognitive difficulties, mental fatigue, polycystic ovary syndrome, psychological wellbeing, women

Introduction

The mental health of women is an issue of concern all over the globe particularly in some cultures and society whereby mental health is a taboo and stigmatized. (Atif et al., 2016; Causier et al., 2024; Mirza et al., 2009). In this kind of culture, women in Pakistan can hardly discuss their mental health issues because of the stigma and misconceptions around them, and

*Corresponding Author: haieqazahid@gmail.com

they cannot easily find help or even openly admit that they are struggling (Ahmad et al., 2017; Javed et al., 2024; Naeem et al., 2014). In addition, there have been increased incidences of polycystic ovary syndrome (PCOS) in Pakistani women and this is further complicating the problem that is already a taboo and cannot be discussed openly. The Pakistani culture is conservative and discussion of reproductive and sexual health is viewed as a source of shame. The prevalence of PCOS among Pakistani women is quite high and higher than in the rest of the world (Akram & Roohi, 2015). PCOS symptoms do not just have a physical manifestation with the interrupted cycles and hormonal disorders (Teede et al., 2010), but they have a psychological impact that is often ignored (Ibáñez et al., 2017), especially cognitive difficulties (Huddleston et al., 2024) and mental fatigue (Abdollahi et al., 2018).

In Pakistani society, marriage has a lot of cultural, traditional and religious significance. Girls are prepared to take this role from a very young age hence it shapes their personalities. It is perceived that sound and successful marriage rests upon the women's ability to conceive and produce children (Tabassum et al., 2023), so the diagnosis of PCOS itself is a heavy burden for women to bear because it is one of the major reasons of female related infertility (Rizwan, 1969). After being diagnosed with such an illness, it is natural for women to be worried about their identity (Amiri et al., 2014), marriage prospects and future stability (Rajkumar et al., 2022). The hormonal imbalances and the psychosocial pressure by consistently thinking about all this can lead to stress (Ranabir & Reetu, 2011) which in turn causes mental fatigue (Gavelin et al., 2020) and cognitive difficulties (Yuen et al., 2012).

Cognitive difficulties refer to the cognitive impairments where an individual notices changes in cognitive function in themselves, particularly in their attention, perception, and memory (Lin et al., 2022). They can interfere with meaningful engagement with the environment, self-perception, and interpersonal functioning (Hsu & Bai, 2022; Karademas et al., 2019). Whereas, Mental fatigue is a psychobiological state resulting from prolonged cognitive activity, encompasses subjective tiredness, decreased motivation (Boksem & Tops, 2008), and impaired cognitive functioning (Boksem et al., 2005a; Boksem et al., 2005b). These two states are often interconnected and may reinforce each other, leading to a cycle of diminished cognitive capacity and emotional resilience (Walkiewicz et al.,

2023). Cognitive difficulties and mental fatigue have a direct impact on psychological well-being including areas such as environmental mastery, autonomy, personal growth, purpose in life, self-acceptance, and positive relations (Gates et al., 2014; Iraldo, 2024; Walkiewicz et al., 2023) and psychological well-being has a direct impact on daily life functioning (Dhanabhakyam & Sarath, 2023). Emerging research also suggests that mental fatigue may independently predict psychological distress (Bajpai & Sharma, 2025), a relationship that finds strong support in cognitive, neurobiological, and sociocultural frameworks. According to Cognitive Load Theory, mental fatigue impairs the limited capacity of working memory, making it more difficult to manage stress and regulate emotional responses (Sweller, 1988). Similarly, Ego Depletion Theory posits that self-control draws from a finite pool of cognitive resources, which, when exhausted, can lead to increased emotional vulnerability and psychological distress (Baumeister et al., 1998). From a neurobiological standpoint, sustained mental fatigue is associated with reduced activity in the prefrontal cortex, compromising executive functions such as attention regulation, decision-making, and emotional control, thereby heightening distress (van der Linden et al., 2003). The Stress-Appraisal Model further supports this by asserting that distress arises when perceived demands exceed coping capacity, a threshold more easily crossed when an individual is mentally fatigued (Lazarus & Folkman, 1984). In the cultural context of South Asia, where societal expectations and emotional restraint are highly valued, persistent mental fatigue often goes unacknowledged, further intensifying its psychological toll (Khan et al., 2020)

In a society where women are expected to fulfill multiple roles and responsibilities, all of this becomes an added burden which hinders in the way of performing everyday responsibilities. (Barnard et al., 2007), Moreover, with the lack of understanding and support from healthcare providers and the community at large, this exacerbates their distress, leaving them feeling isolated and misunderstood (Witchel et al., 2019). In many cases, the emotional toll of living with PCOS may be dismissed or misunderstood, contributing to guilt and psychological distress (Khan et al., 2024). The gaslighting involved leaves them doubting themselves for all the dysfunction in their daily lives, thinking that they are going crazy (Chopra et al., 2021; Seabrook, 2024). This amounts to these women being suggestible and vulnerable, making them prone to mental illnesses (Mirza, 2024).

Rationale

The PCOS is a disorder that impacts a high percentage of women of reproductive age all over the world, and is said to have 1 per 10 women (World Health Organization, 2025). Even though PCOS is a very common issue among Pakistani women, it is characterized by a great deal of stigma and a lack of discussion in Pakistan on the issue because cultural taboos are associated with reproductive and hormonal matters. It is this silence, which leads to the lack of awareness, late diagnoses, and lack of mental health assistance (Tariq et al., 2024). PCOS has gained immense attention in recent times and scientists have investigated its physiological, physical and reproductive features but have not done much research on its psychological side particularly in Pakistani people. Certain studies have shown that female patients of PCOS tend to have high rates of cognitive difficulties and mental fatigue that can deteriorate their functioning in everyday life and lead to the reduction of psychological well-being (Gavelin et al., 2020; Ranabir and Reetu, 2011; Yuen et al., 2012). Women not only have to face the psychological and physiological impact of PCOS but also the stressors of sociocultural nature that encompass invalidation by other healthcare providers and peers alongside contributing to the further worsening of the emotional distress (Tariq et al., 2024; Khan et al., 2024). The study aims at answering the question: how to correlate mental fatigue and cognitive challenges and its impact on psychological well-being of Pakistani women with PCOS. The study seeks to deliver a better comprehensive knowledge of mental health challenges encountered by this population by investigation of these relationships. The results will assist in informing culturally sensitive interventions, informing the public health awareness, and impacting the healthcare policy in favor of more comprehensive, patient-focused yet holistic models of care. Finally, the proposed study will respond to the psychologic effects of PCOS through a correlational study.

Objectives

The study aims to investigate the relationship between mental fatigue, cognitive difficulties and psychological well-being in women diagnosed with PCOS. Specifically, we seek to determine whether higher levels of self-reported mental fatigue are associated with lower psychological well-being, and likewise whether greater cognitive difficulties correspond to lower well-being in this population. By evaluating the relationship between

these variables, our goal is to deepen understanding of the ways in which PCOS may compromise women's psychological functioning.

Hypotheses

- There is likely to be a negative relationship between mental fatigue and psychological wellbeing of women with PCOS.
- There is likely to be a negative relationship between cognitive difficulties and psychological wellbeing of women with PCOS.
- There is likely to be a positive relationship between mental fatigue and cognitive difficulties among women with PCOS.
- Psychological wellbeing is likely to be predicted by mental fatigue and cognitive difficulties in women with PCOS.

Method

Sample

A correlational study was conducted on 60 women with PCOS to find out the relationship among cognitive difficulties, mental fatigue and psychological well-being. The women were recruited from the public and private hospitals and clinics of Punjab, Pakistan through non probability purposive sampling. Women were eligible for the study if they were diagnosed with PCOS by a gynecologist and had an age between 15-45 years. Women with any diagnosed mental disorder were not included in the study. Similarly, women with any other medical disease like endometriosis, Type 2 Diabetes Mellitus, and cardiovascular diseases were not included in the sample.

Measures

Demographic Information Questionnaire

Demographic Information Questionnaire was made in Urdu which included participant's information i.e age, education, profession, average family income, marital status, number of children, area of living, and family system. It included variables questions about the patient's menstrual cycle, weight, height, and BMI (using the formula BMI = $kg/m^{2)}$. It also included questions relevant to the diagnosis of PCOS, the duration of illness and treatment, and the presence of any other diagnosed mental or physical illness.

Cognitive Failures Questionnaire

The Cognitive Failures Questionnaire (CFQ), originally developed by Broadbent et al. (1982), was translated into Urdu by the researchers. This self-report measure evaluates the frequency of attention, memory, and cognitive lapses in daily life. The CFQ contains 25 items, which can be scored by either the participant or a significant other. Scores are based on the frequency of errors, ranging from 0 (*never*) to 4 (*very often*), resulting in a total score between 0 and 100. By summing the relevant items, subscale scores can be derived for three dimensions of cognitive failure: forgetfulness (Items 1, 2, 5, 7, 17, 20, 22, and 23), distractibility (Items 8, 9, 10, 11, 14, 19, 21, and 25), and false triggering (Items 2, 3, 5, 6, 12, 18, 23, and 24). Forgetfulness is a tendency to let go from one's mind something known or planned (for example, names, intentions, appointments, and words), distractibility is "mainly in social situations or interactions with other people such as being absentminded or easily disturbed in one's focused attention" and false triggering is "interrupted processing of sequences of cognitive and motor action. The scale has a high internal consistency of items with a cronbach's alpha of .85.

Mental Fatigue Scale

The Mental Fatigue Scale by Johansson and Ronnback (2014) was used which was translated in Urdu by the researchers. This scale consisted of 15 items. The first 14 items measure mental fatigue in general and are framed in the form of questions with descriptive rating options of 0, 0.5, 1, 1.5, 2, 2.5 and 3. The value of 0 indicates *slight* and 3 indicates *serious problem*. These items encompass fatigue in general, lack of initiative, mental fatigue, mental recovery, concentration difficulties, memory problems, slowness of thinking, sensitivity to stress, increased tendency to become emotional, irritability, sensitivity to light and noise, and decreased or increased sleep. The15th item, ranges from 0 to 2, and is concerned with variations in fatigue across a day. This item is for clinical use and is not used in the scoring. Johansson et al. (2009) demonstrated significant correlations among the 14 items, which have also been shown to have strong internal consistency, with a Cronbach's alpha of 0.94.

Ryff's Scale of Psychological Well-being

The Ryff's scale of psychological well-being constructed by Ryff (1989) was translated in Urdu by Jibeen and Khalid (2012). It consists of 54

items with 6 subscales; self-acceptance, positive relations, autonomy, environmental mastery, personal growth, and purpose in life. Self-acceptance is fully embracing oneself, both strengths and weaknesses, without judgment or criticism. Each item is typically scored on a Likert scale, with response options ranging from, for example, "1 = *strongly disagree*" to "6 = *strongly agree*. Out of 54, 28 items are reverse scored. Higher scores on each dimension and the overall scale generally indicate higher levels of psychological well-being. The scale exhibits acceptable internal consistency (α) ranging from .88 to .81.

Procedure

The Cognitive Difficulties Scale (CDS) and the Mental Fatigue Scale (MFS) were translated into Urdu through a rigorous process involving forward (English into Urdu) and backward (Urdu into English) translation methods using MAPI methodology for tool translation (Responsive Translation, n.d.).

Four translators with proficiency in English and Urdu language, including the researcher, two professional clinical psychologists, and a clinical psychology graduate, independently translated the questionnaires into Urdu, ensuring clarity and natural language. A reconciliation meeting with research supervisor was held to select the best translated items, resulting in a reconciled forward translation. This translation was then reviewed by an Urdu language expert (MA Urdu) which resulted in minor changes. This version was then backward translated by an expert in English language (MA English). A final review compared the backward translation with the original English questionnaires to ensure conceptual equivalence with the original items (Acquadro et al., 2008). Following this, a pilot study was conducted, involving 10 participants with PCOS, to test the adequacy and effectiveness of the research instruments. This process ensured the clarity, intelligibility, appropriateness, and cultural relevance of the questionnaire in the target language. After the pilot study, on order to establish reliability, internal consistency was assessed using Cronbach's alpha, which indicated acceptable reliability across subscales. While no full-scale validation study was conducted, the translated version demonstrated conceptual compatibility with the English version and retained the intended meaning of the items. Minor language adjustments were made to ensure cultural relevance without altering item content. The participants were then approached for data collection by taking permission

from the public and private hospitals and clinics of Lahore and Rawalpindi. The participants were explained the purpose of research, informed about their right to confidentiality and their right to withdraw from the study at any time without any penalty. Some participants were reluctant to take part in the study because of the stigma attached to mental health, so the participants were explained about the study and their right to participation was taken into consideration. Having signed the informed consent, self-report assessment questionnaires were handed out to the participants and were asked to fill it.

Ethical Consideration

Ethical considerations were carefully observed throughout this research study. The permission to conduct the study was given by the Institutional Review Board. Moreover, the authors of the scales and questionnaires were reached out through mail and were asked for permission of use, both for their use in the study and for their translation into Urdu. Written consent was secured from PCOS patients, confirming their voluntary participation. Confidentiality of all data was strictly maintained, and participants were informed that they would receive no penalty if they decide to remove themselves from the study at any given point. No participants were subjected to any physical or psychological harm during the study.

The authors assert that all procedures contributing to this work comply with the ethical standards of the relevant national and institutional committees on human experimentation and with the Helsinki Declaration of 1975, as revised in 2013. All procedures involving human subjects/patients were approved by Institutional Review Board.

Results

Results were obtained using software, statistical package for social sciences (SPSS, version 21). The statistical analysis included descriptive statistics for the variables, as well as inferential methods such as correlation and regression. The below mentioned Table present psychometric properties of the scales used in the study.

Table 1

Psychometric Properties of Major Study Variables (N=60)

Scale	*M*	*SD*	Range	α
Cognitive Difficulties	52.05	15.60	20-89	.84

Scale	*M*	*SD*	Range	α
Forgetfulness	17.46	5.61	4-27	.71
Distractibility	18.01	5.46	6-27	.65
False Triggering	14.11	5.74	3-27	.68
Mental Fatigue	18.09	7.37	5-37	.85
Psychological Wellbeing	199.95	33.56	109-277	.86
Autonomy	30.01	7.90	9-44	.73
Environmental Mastery	33.10	6.81	16-48	.67
Personal Growth	32.21	13.88	18-46	.66
Positive Relations with Others	35.11	7.26	18-50	.70
Purpose in Life	35.21	6.85	26-51	.67
Self-Acceptance	34.13	8.19	14-49	.80

Table 2

Demographic Characteristics of Sample

Variables	*n (%)*	*M (SD)*
Age		23.96 (3.74)
Education Years		
Middle School	2 (3.3)	
Matric	1 (1.7)	
Intermediate	3 (5.0)	
Undergraduate	43 (71.7)	
Graduate	11 (18.3)	
Profession		
Student	30 (50)	
Unemployed	8 (13.3)	
Employed	22 (36.6)	
Family Income (avg)		134283.33 (95705.95)
10000-90000	23 (38.3)	
100000-190000	23 (38.3)	
200000-290000	8 (13.3)	
300000-390000	3 (5)	
400000-490000	2 (3.3)	
500000-590000	1 (1.7)	
Birth Order		
1st	22 (36.7)	
2nd	15 (25.0)	

Variables	*n (%)*	*M (SD)*
3rd	13 (21.7)	
4th	8 (13.3)	
5th	2 (3.3)	
Marital Status		
Single	18 (30)	
Married	42 (70)	
Number of children		
No Child	53 (88.3)	
1	5 (8.3)	
2	2 (3.3)	
Residency		
Rural	7 (11.7)	
Urban	53 (88.3)	
Family System		
Nuclear	36 (60)	
Joint	24 (40)	
Menstrual Cycle		
Regular	13 (21.7)	
Irregular	47 (78.3)	
Weight (kg)		63.85 (13.99)
Height (cm)		161.20 (6.34)
BMI		
Underweight (>18.5)	6 (10)	
Healthy weight (18.5-25)	28 (46.7)	
Overweight (25-30)	17 (28.3)	
Obesity (<30)	9 (15)	
Hospital		
Government	21 (35)	
Private	39 (65)	
Duration of Illness		3.86 (3.32)
0-3 years	35 (58.3)	
3-6 years	16 (26.7)	
6-9 years	6 (10.0)	
9-12 years	0	
12-15 years	3 (05.0)	
Duration of Treatment		2.05 (2.06)
0-3	49 (81.7)	

Variables	*n (%)*	*M (SD)*
3-6	7 (11.7)	
6-9	4 (6.7)	
12-15	0	

The sample consisted of 60 participants, predominantly young women with a mean age of 23.97 years (*SD* = 3.74). 70% of them were married while 30% were unmarried. Educationally, the majority were pursuing undergraduate degrees (71.7%), followed by graduate studies (18.3%). Half of the participants identified as students (50%), 8% were unemployed while 22% were employed. The average family income was 134,283.33 Pakistani Rupees, with the most common income bracket falling between 100,000-190,000 Rupees (38.3%). Firstborns constituted the largest proportion of the sample (36.7%), and the majority were married (70%) with no children (88.3%). Urban residency was prevalent (88.3%), with more participants coming from nuclear families (60%) than from joint families (40%). The majority reported irregular menstrual cycles (78.3%). Anthropometric data indicated an average weight of 63.85 kg (*SD* = 13.997) and an average height of 161.20 cm (*SD* = 6.340), with most participants falling into the healthy weight range (46.7%). 10% were underweight whereas 28.3% were overweight, and 15% were obese. Regarding healthcare, more participants received treatment from private hospitals (65%) compared to government hospitals (35%). Most had experienced their illness for 0-3 years (58.3%) and had been undergoing treatment for a similar duration (81.7%). None reported other mental or physical illnesses.

Table 3

Correlation among Cognitive Difficulties, Mental Fatigue and Psychological Wellbeing

Variables	2	3	4	5	6	7	8	9	10	11	12
1.F	.68**	.74***	.87***	.35**	.11	-.23	-.05	-.51***	-.12	-.30*	-.25*
2.D	-	.50***	.81***	.35**	-.05	-.34**	.04	-.51***	-.15	-.40**	-.30*
3.FT		.-	.83***	.43**	-.04	-.31*	-.08	-.45***	-.27*	-.39**	-.35**
4.CD			-	.47***	-.01	-.41**	-.04	-.55***	-.30*	-.47***	-.40**
5.MF				-	-.02	-.34**	-.22	-.42**	-.44***	-.53***	-.48***
6.A					-	.20	.-.16	.-.05	.26*	.29*	.32*
7.EM						-	.19	.62***	.69***	.70***	.77***
8.PG							-	.24	.27*	.33**	.60***
9.PR								-	.49***	.57***	.66***
10.PL									-	.68***	.79***
11.SA										-	.85***
12. PWB											-

Note. *N*=60, For = Forgetfulness, D = Distractibility, FT = False Triggering,

CD = Cognitive Difficulties, MF = Mental Fatigue, A = Autonomy, EM =Environmental Mastery, PG = Personal Growth, PR = Positive Relations, PL = Purpose in Life, SA = Self-Acceptance, PWB=Psychological Wellbeing.
*p< .05. **p<.01.***p<.001.

The correlation results presented the relationships among cognitive difficulties (forgetfulness, distractibility, and false triggering), mental fatigue, and psychological well-being dimensions (autonomy, environmental mastery, personal growth, positive relations, purpose in life, self-acceptance) in women with PCOS. Forgetfulness was negatively associated with positive relations, self-acceptance, and overall psychological wellbeing. Similarly, distractibility showed negative relationships with environmental mastery, personal growth, self-acceptance, and psychological wellbeing. False triggering also demonstrated negative associations with environmental mastery, positive relations, purpose in life, self-acceptance, and psychological wellbeing. Overall, cognitive difficulties was negatively correlated with environmental mastery, positive relations, purpose in life, self-acceptance, and psychological wellbeing, suggesting that higher cognitive difficulties are linked to lower psychological well-being. In addition, mental fatigue was negatively related to environmental mastery, positive relations, self-acceptance, and psychological wellbeing, indicating that increased mental fatigue is associated with reduced psychological well-being. Lastly, a significant positive correlation was found between cognitive difficulties and mental fatigue, suggesting that as cognitive difficulties increase, so does the level of mental fatigue.

Table 4

Multiple Regression analysis predicting Psychological Wellbeing from Cognitive Difficulties and Mental Fatigue

Variables	*B*	*β*	SE	*t*	*p*	95%CI
Constant	251.49	-	14.72	17.09	.000	[221.99, 280.99]
Forgetfulness	1.05	.17	1.22	.86	.392	[-1.39, 3.5]
Distractibility	-1.03	-.16	.98	-1.05	.298	[-2.99, .93]
False Triggering	-1.40	-.24	1.05	-1.34	.188	[-3.49, .70]
Mental Fatigue	-1.75	-.38	.588	-2.98	.004	[-.57, -.78]

A multiple regression analysis was carried out to identify the predictors of psychological well-being. The R^2 value of .28 revealed that the predictors explained 28% variance in the outcome variable with F (4, 55) = 5.30, p<.001. The findings showed that mental fatigue negatively predicted psychological wellbeing (β=-.385, p < 0.01) which means that women who have increased mental fatigue, have lower psychological wellbeing.

Discussion

The present study aimed to investigate the relationship between cognitive difficulties, mental fatigue, and psychological well-being in women diagnosed with PCOS. The findings provide important insights into how cognitive and mental health challenges are associated with psychological well-being in this population.

The study's findings were consistent with existing literature that cognitive difficulties including forgetfulness, distractibility, and false triggering were found to be significantly negatively correlated with psychological well-being, particularly environmental mastery, positive relations, purpose in life, and self-acceptance. Previous studies reported that cognitive impairments can interfere with an individuals' ability to engage meaningfully with their environment, have difficulty maintaining interpersonal relationships and in developing a coherent sense of self (Hsu & Bai, 2022; Karademas et al., 2019).

These findings may be particularly relevant in the Pakistani context, where cognitive and emotional symptoms of chronic conditions like PCOS are often under-recognized and dismissed. In cultures where talking about reproductive health is already considered a taboo, the burden of mental fatigue is increased by the negative psychological impact of being invalidated by healthcare providers or family members (Khan et al., 2024). The study's finding showed that cognitive difficulties do not predict psychological wellbeing, which may reflect the cultural norms of Pakistani society where women are expected to perform and function without acknowledging distress however it leads to emotional exhaustion in the long term. This aligns with the stress-appraisal model (Lazarus & Folkman, 1984), which states that psychological well-being is affected not just by symptoms but by perceived coping resources that are often limited for Pakistani women facing stigma and societal pressure.

Interestingly, while bivariate correlations showed significant negative

associations between cognitive difficulties and psychological well-being, the regression analysis did not identify cognitive difficulty subcomponents as significant independent predictors. This suggests that although cognitive difficulties are related to psychological well-being at a correlational level, their unique contribution may diminish when other variables, such as mental fatigue, are accounted for. This may indicate shared variance among predictors.

Mental fatigue emerged as a significant negative predictor of psychological well-being in the regression model. The study found that women who reported higher levels of mental fatigue were more likely to experience lower psychological well-being. This is consistent with previous research linking fatigue with emotional distress, reduced motivation, and impaired coping (Bajpai & Sharma, 2025). In PCOS where fatigue may be exacerbated by hormonal imbalances, metabolic issues, and mood disturbances (Shukla et al., 2025), the importance of addressing fatigue in both clinical and psychological interventions is necessary.

As supported by the cognitive load theory (Sweller, 1988), which explains how persistent mental overload impairs attention, memory, and emotional regulation, the findings of this study also suggest that the bidirectional relationship between mental fatigue and cognitive difficulties may cause cognitive strain which may lead to fatigue and vice versa; hence resulting in a loop eventually contributing to reduced psychological well-being. Such effects are compounded in the Pakistani culture where women are frequently expected to be highly functional even when they feel tired or emotionally distressed under the social and family pressure to be calm and carry on with their lives. In sum, the regression model described the variation in psychological well-being by 28 per cent, which means that, even though cognitive and mental fatigue are important predictors of decreased well-being, other variables, including body image concerns, hormone changes, social stigma, comorbid mental conditions could have influenced and should be investigated in the future.

Implications

The study implications provide useful information on the relationship between cognitive problems and mental exhaustion and psychological well-being among PCOS women. Although the findings do not establish

causality, they highlight the important patterns that can inform public awareness, healthcare engagement, and future research.

The findings of this study explore the relationship between cognitive difficulties and mental fatigue in women with PCOS and emphasize the importance of recognizing psychological dimensions of this condition. These findings can contribute to awareness campaigns which aim at reducing stigma and encouraging open discussions about the mental and cognitive experiences associated with PCOS. In Pakistani society such awareness is especially important because topics related to reproductive health concerns are often under-discussed.

The findings also suggest that while exploring physical symptoms of PCOS, healthcare providers should also be attuned to the psychological symptoms reported by PCOS patients. While this study does not evaluate clinical interventions, the relationship of variables in this study implies that there should be a culturally sensitive dialogue around mental health and cognitive well-being during consultations. This can help foster trust and encourage help-seeking behavior among women who may otherwise feel dismissed or misunderstood.

Although this study does not examine workplace outcomes directly, the results of this study raise questions about how cognitive fatigue might affect daily functioning and work performance. These insights can support the development of workplace policies that are more accommodating and understanding of hidden symptoms associated with chronic health conditions such as PCOS.

The findings underscore the potential value of supportive social environments in managing the psychological impact of PCOS. Encouraging families and communities to acknowledge the cognitive and emotional challenges women may face could help reduce social isolation and facilitate access to informal support networks.

By identifying significant correlations between mental fatigue and cognitive difficulties, this study highlights the need for further patient education. Helping women understand how these symptoms may be interconnected might support self-awareness and self-advocacy during clinical encounters. Although this study does not evaluate interventions, the findings can guide educational content in psychoeducational programs.

The correlational patterns identified in this study may inform future research, particularly in exploring whether targeted interventions (psychological, medical, or social) could moderate the relationship between PCOS symptoms and mental health outcomes. Policymakers and healthcare planners might consider these findings when designing holistic care pathways that integrate mental health screening and support within PCOS treatment frameworks.

While this study does not establish cause-and-effect relationships, it offers foundational insights into the co-occurrence of cognitive difficulties and mental fatigue among Pakistani women with PCOS.

Strengths and Limitations

The study is one of its kinds to comprehensively explore the psychological consequences of PCOS. By employing a comprehensive assessment approach, the study captures the complex interplay among cognitive difficulties, mental fatigue and psychological wellbeing, providing a deep understanding of their relationships in the women suffering from PCOS. It also considers the cultural background of Pakistani women since it was carried out through research in healthcare institutions in Punjab, Pakistan. It renders the study results more applicable and relevant to the target population because it took into consideration the cultural specifics and contextual parameters. Considering the sensitivity of the issue in terms of cultural perspective, initially, women were reluctant to complete the questionnaire. To overcome this, the purpose of the study and the right of the participants to voluntary participation were explained, which alleviated the concerns. In addition, even some women with PCOS did not fill the proforma due to stigma attached to their physical disorder. Thus, the study is crucial in providing an insight into the psychological aspects of PCOS in a culturally competent way and contribute to the creation of awareness to Pakistani women who have this disorder. Among the considerations in this study is the fact that the translated self-report measures were not subjected to extensive validity testing as such, but it was rigorously translated and culturally adapted and it shows high reliability in analysis. Even though the current results may be improved through further validity testing, the existing evidence is sufficient to use the findings to determine the evidence of cognitive difficulties and mental fatigue in the target population. Future studies can expand on this one by involving more detailed validity judgments. Although cognitive difficulties, mental fatigue,

and psychological well-being are studied, other factors that might have affected the results which include demographic factors, hormonal levels, drug usage, and lifestyle factors, are not measured. It is desirable that future studies integrate more variables to reflect the complexity of PCOS and its effects on the health of women.

Conclusion

The findings underline the correlation between cognitive difficulties, mental fatigue and psychological well-being. To be more precise, the increased levels of cognitive difficulty and mental fatigue resulted in lower levels of psychological well-being. In addition, the correlation between cognitive problems and mental exhaustion was significantly positive. Regression analysis also showed that mental fatigue was a significant predictor of poor psychological wellbeing. Comprehensively, these results underscore the need to focus on cognitive challenges and the exhaustion of the human mind in ensuring psychological wellbeing of Pakistani women with PCOS and indicate possible directions of specific interventions aimed at ensuring better overall mental health outcomes in Pakistan.

Conflict of Interest

The author of the manuscript has no financial or non-financial conflict of interest in the subject matter or materials discussed in this manuscript.

Data Availability Statement

The data associated with this study will be provided by the corresponding author upon request.

Funding Details

No funding has been received for this research.

References

Abdollahi, L., Mirghafourvand, M., Babapour, J. K., & Mohammadi, M. (2018). Effectiveness of cognitive-behavioral therapy (CBT) in improving the quality of life and psychological fatigue in women with polycystic ovarian syndrome: A randomized controlled clinical trial. *Journal of Psychosomatic Obstetrics & Gynecology*, *40*(4), 283–293. https://doi.org/10.1080/0167482x.2018.1502265

Acquadro, C., Conway, K., Hareendran, A., & Aaronson, N. (2008). Literature review of methods to translate health-related quality of life questionnaires for use in multinational clinical trials. *Value in Health*, *11*(3), 509–521. https://doi.org/10.1111/j.1524-4733.2007.00292.x

Ahmad, I., Khalily, M. T., & Hallahan, B. (2017). Reasons associated with treatment non-adherence in schizophrenia in a Pakistan cohort. *Asian Journal of Psychiatry*, *30*, 39–43. https://doi.org/10.1016/j.ajp.2017.07.024

Akram, M., & Roohi, N. (2015). Endocrine correlates of polycystic ovary syndrome in Pakistani women. *Journal of the College of Physicians and Surgeons Pakistan*, *25*(1), 22–26. https://pubmed.ncbi.nlm.nih.gov/25604364

Amiri, F. N., Tehrani, F. R., Simbar, M., Thamtan, R. A. M., & Shiva, N. (2014). Female gender scheme is disturbed by polycystic ovary syndrome: A qualitative study from Iran. *Iranian Red Crescent Medical Journal*, *16*(2), Article e12423. https://doi.org/10.5812/ircmj.12423

Atif, N., Lovell, K., Husain, N., Sikander, S., Patel, V., & Rahman, A. (2016). Barefoot therapists: Barriers and facilitators to delivering maternal mental health care through peer volunteers in Pakistan: A qualitative study. *International Journal of Mental Health Systems*, *10*(1), Article e5. https://doi.org/10.1186/s13033-016-0055-9

Bajpai, A., & Sharma, D. (2025). Psychological distress and fatigue in polycystic ovarian syndrome: A pilot study. *Journal of Human Reproductive Sciences*, *18*(1), Article e25. https://doi.org/10.4103/jhrs.jhrs_25_25

Barnard, L., Ferriday, D., Guenther, N., Strauss, B., Balen, A., & Dye, L. (2007). Quality of life and psychological well-being in polycystic ovary syndrome. *Human Reproduction*, *22*(8), 2279–2286. https://doi.org/10.1093/humrep/dem108

Baumeister, R. F., Bratslavsky, E., Muraven, M., & Tice, D. M. (1998). Ego depletion: Is the active self a limited resource? *Journal of Personality and Social Psychology*, *74*(5), 1252–1265. https://doi.org/10.1037/0022-3514.74.5.1252

Boksem, M. A., & Tops, M. (2008). Mental fatigue: Costs and benefits. *Brain Research Reviews*, *59*(1), 125–139. https://doi.org/10.1016/j.brainresrev.2008.07.001

Boksem, M. A., Meijman, T. F., & Lorist, M. M. (2005a). Effects of mental fatigue on attention: An ERP study. *Cognitive Brain Research*, *25*(1), 107–116. https://doi.org/10.1016/j.cogbrainres.2005.04.011

Boksem, M. A., Meijman, T. F., & Lorist, M. M. (2005b). Mental fatigue, motivation and action monitoring. *Biological Psychology*, *72*(2), 123–132. https://doi.org/10.1016/j.biopsycho.2005.08.007

Broadbent, D. E., Cooper, P. F., FitzGerald, P., & Parkes, K. R. (1982). The Cognitive Failures Questionnaire (CFQ) and its correlates. *British Journal of Clinical Psychology*, *21*(1), 1–16. https://doi.org/10.1111/j.2044-8260.1982.tb01421.x

Causier, C., Johns, L., Radez, J., Hassan, H., Maughan, D., & Waite, F. (2024). Experiences of help-seeking for severe mental health problems in young Pakistani women: A preliminary qualitative study. *Journal of Cross-Cultural Psychology*, *55*(4), 429–443. https://doi.org/10.1177/00220221241236944

Chopra, S., Zehrung, R., Shanmugam, T. A., & Choe, E. K. (2021, May 8–13). *Living with uncertainty and stigma: Self-experimentation and support-seeking around polycystic ovary syndrome* [Paper presentation]. Proceedings of the 2021 CHI Conference on Human Factors in Computing Systems, New York, United States.

Dhanabhakyam, M., & Sarath, M. (2023). Psychological wellbeing: A systematic literature review. *International Journal of Advanced Research in Science Communication and Technology*, *3*, 603–607. https://doi.org/10.48175/ijarsct-8345

Gates, N., Valenzuela, M., Sachdev, P., & Singh, F. (2014). Psychological well-being in individuals with mild cognitive impairment. *Clinical Interventions in Aging*, *9*, 779–792. https://doi.org/10.2147/cia.s58866

Gavelin, H. M., Neely, A. S., Dunås, T., Eskilsson, T., Järvholm, L. S., & Boraxbekk, C. (2020). Mental fatigue in stress-related exhaustion disorder: Structural brain correlates, clinical characteristics and relations with cognitive functioning. *NeuroImage: Clinical*, *27*, Article e102337. https://doi.org/10.1016/j.nicl.2020.102337

Hsu, H., & Bai, C. (2022). Individual and environmental factors associated with cognitive function in older people: A longitudinal multilevel analysis. *BMC Geriatrics*, *22*(1), Article e311. https://doi.org/10.1186/s12877-022-02940-9

Huddleston, H. G., Jaswa, E. G., Casaletto, K. B., Neuhaus, J., Kim, C., Wellons, M., Launer, L. J., & Yaffe, K. (2024). Associations of polycystic ovary syndrome with indicators of brain health at midlife in the CARDIA cohort. *Neurology*, *102*(4), Article e8104. https://doi.org/10.1212/wnl.0000000000208104

Ibáñez, L., Oberfield, S. E., Witchel, S., Auchus, R. J., Chang, R. J., Codner, E., Dabadghao, P., Darendeliler, F., Elbarbary, N. S., Gambineri, A., Rudaz, C. G., Hoeger, K. M., López-Bermejo, A., Ong, K., Peña, A. S., Reinehr, T., Santoro, N., Tena-Sempere, M., Tao, R., … Lee, P. A. (2017). An international consortium update: Pathophysiology, diagnosis, and treatment of polycystic ovarian syndrome in adolescence. *Hormone Research in Paediatrics*, *88*(6), 371–395. https://doi.org/10.1159/000479371

Iraldo, T. (2024). Mental fatigue and sleep: Exploring the bidirectional relationship. *Allied Academies Journal of Clinical Neurology*, *7*(3), Article e214. https://doi.org/10.35841/aacnj-7.3.214

Javed, M. A., Ahsan, W., Khattak, U. K., & Afzal, S. (2024). Stigma associated with seeking psychiatric care among the general population of Islamabad, Pakistan. *Pakistan Journal of Public Health*, *14*(1), 33–37. https://doi.org/10.32413/pjph.v14i1.1197

Jibeen, T., & Khalid, R. (2012). Cross validation of Ryff's scales of psychological well-being: Translation into Urdu language. *The International Journal of Educational and Psychological Assessment*, *10*(2), 35–51.

Johansson, B., Berglund, P., & Rönnbäck, L. (2009). Mental fatigue and impaired information processing after mild and moderate traumatic brain injury. *Brain Injury*, *23*(13-14), 1027-1040. https://doi.org/10.3109/02699050903421099

Johansson, B., & Ronnback, L. (2014). Evaluation of the mental fatigue scale and its relation to cognitive and emotional functioning after

traumatic brain injury or stroke. *International Journal of Physical Medicine & Rehabilitation, 2*(1), 1–7.

Karademas, E. C., Simos, P., Zaganas, I., Tziraki, S., Panagiotakis, S., Basta, M., & Vgontzas, A. N. (2019). The impact of mild cognitive impairment on the self-regulation process: A comparison study of persons with mild cognitive impairment and cognitively healthy older adults. *Journal of Health Psychology*, *24*(3), 351–361. https://doi.org/10.1177/1359105316674270

Khan, K., Tariq, N. U. S., & Majeed, S. (2024). Psychological impact of medical gaslighting on women: A systematic review. *Journal of Professional & Applied Psychology*, *5*(1), 110–125. https://doi.org/10.52053/jpap.v5i1.249

Khan, M. A., Jafree, S. R., & Jibeen, T. (2020). Social barriers to mental well-being in women of South Asia. In M. M. Cornelio (Ed.), *Women's mental health: Resistance and resilience across cultures* (pp. 129–150). Springer. https://doi.org/10.1007/978-3-030-50204-1_7

Lazarus, R. S., & Folkman, S. (1984). *Stress, appraisal, and coping.* Springer Publishing Company.

Lin, L., Wang, S., Xu, W., Hu, Q., Zhang, P., Ke, Y., Huang, J., Ding, K., Li, X., Hou, C., & Jia, F. (2022). Subjective cognitive decline symptoms and their association with socio-demographic characteristics and common chronic diseases in southern Chinese older adults. *BMC Public Health*, *22*(1), Article e12522. https://doi.org/10.1186/s12889-022-12522-4

Mirza, I., Tareen, A., Davidson, L. L., & Rahman, A. (2009). Community management of intellectual disabilities in Pakistan: A mixed methods study. *Journal of Intellectual Disability Research*, *53*(6), 559–570. https://doi.org/10.1111/j.1365-2788.2009.01176.x

Mirza, Z. (2024, November 29). Women's health. *Dawn News*. https://www.dawn.com/news/1875481

Naeem, F., Habib, N., Gul, M., Khalid, M., Saeed, S., Farooq, S., Munshi, T., Gobbi, M., Husain, N., Ayub, M., & Kingdon, D. (2014). A qualitative study to explore patients', carers' and health professionals' views to culturally adapt CBT for psychosis (CBTp) in Pakistan.

Behavioural and Cognitive Psychotherapy, *44*(1), 43–55. https://doi.org/10.1017/s1352465814000332

Rajkumar, E., Ardra, A., Prabhu, G., Pandey, V., Sundaramoorthy, J., Manzoor, R., Sooraj, K., Manikandaprabu, M., & Badiger, T. (2022). Polycystic ovary syndrome: An exploration of unmarried women's knowledge and attitudes. *Heliyon*, *8*(7), Article e09835. https://doi.org/10.1016/j.heliyon.2022.e09835

Ranabir, S., & Reetu, K. (2011). Stress and hormones. *Indian Journal of Endocrinology and Metabolism*, *15*(1), 18–22. https://doi.org/10.4103/2230-8210.77573

Responsive Translation. (n.d.). *MAPI validation for clinical trial translation*. Retrieved July 22, 2024, from https://www.responsivetranslation.com/clinical-trial-translation/mapi-validation-clinical-trial-translation/

Rizwan, F. (1969). Frequency and outcome of treatment in polycystic ovaries related infertility. *Pakistan Journal of Medical Sciences*, *31*(3), Article e8003. https://doi.org/10.12669/pjms.313.8003

Ryff, C. D. (2013). Psychological well-being revisited: Advances in the science and practice of eudaimonia. *Psychotherapy and Psychosomatics*, *83*(1), 10–28. https://doi.org/10.1159/000353263

Seabrook, S. (2024). Bleed: Destroying myths and misogyny in endometriosis care by Tracey Lindeman. *International Journal of Feminist Approaches to Bioethics*, *17*(2), 181–185. https://doi.org/10.3138/ijfab.17.2.13

Shukla, A., Rasquin, L. I., & Anastasopoulou, C. (2025, May 4). *Polycystic ovarian syndrome*. StatPearls Publishing. https://www.ncbi.nlm.nih.gov/books/NBK459251/

Sweller, J. (1988). Cognitive load during problem solving: Effects on learning. *Cognitive Science*, *12*(2), 257–285. https://doi.org/10.1207/s15516709cog1202_4

Tabassum, A., Sadia, R., & Khan, S. (2023). Impact of infertility-related stress and family and social support on marital satisfaction of infertile individuals. *International Journal of Psychological and Behavioural Research*, *3*(1), 50–73. https://doi.org/10.37605/ijpbr.v3i1.32

Tariq, R., Mahmood, Q. K., & Omer, S. (2024). The experiences and challenges faced by women with polycystic ovary syndrome (PCOS) in Lahore, Pakistan. *Contemporary Issues in Social Sciences and Management Practices*, *3*(3), Article e218. https://doi.org/10.61503/cissmp.v3i3.218

Teede, H., Deeks, A., & Moran, L. (2010). Polycystic ovary syndrome: A complex condition with psychological, reproductive and metabolic manifestations that impacts on health across the lifespan. *BMC Medicine*, *8*(1), Article e41. https://doi.org/10.1186/1741-7015-8-41

van der Linden, D., Frese, M., & Meijman, T. F. (2003). Mental fatigue and the control of cognitive processes: Effects on perseveration and planning. *Acta Psychologica*, *113*(1), 45–65. https://doi.org/10.1016/S0001-6918(02)00150-6

Walkiewicz, M., Zdun-Ryżewska, A., Budziński, W., Tartas, M., & Błażek, M. (2023). Fatigue and the psychological characteristics of medical students. *International Journal of Occupational Medicine and Environmental Health*, *36*(4), 517–525. https://doi.org/10.13075/ijomeh.1896.02116

Witchel, S. F., Oberfield, S. E., & Peña, A. S. (2019). Polycystic ovary syndrome: Pathophysiology, presentation, and treatment with emphasis on adolescent girls. *Journal of the Endocrine Society*, *3*(8), 1545–1573. https://doi.org/10.1210/js.2019-00078

World Health Organization. (2025, February 7). *Polycystic ovary syndrome*. https://www.who.int/news-room/fact-sheets/detail/polycystic-ovary-syndrome

Yuen, E. Y., Wei, J., Liu, W., Zhong, P., Li, X., & Yan, Z. (2012). Repeated stress causes cognitive impairment by suppressing glutamate receptor expression and function in prefrontal cortex. *Neuron*, *73*(5), 962–977. https://doi.org/10.1016/j.neuron.2011.12.033