DEVELOPMENT AND VALIDATION OF MULTIDIMENSIONAL DISTRESS INVENTORY FOR POLYCYSTIC OVARY SYNDROME FOR MUSLIM WOMEN IN PAKISTAN

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ABSTRACT

The study was intended to develop a valid and reliable scale to measure the psycho-socio-spiritual distress among women suffering from Polycystic Ovary Syndrome. This mixed method study, was divided into three phases. Phase I conceptualized spiritual distress in the Muslim population. Phase II involved item generation, inventory development, and pilot testing. Phase III assessed convergent validity by correlating the new scale with the Mental Health Inventory psychological distress subscale, Social Provision Scale (SPS-U), and Muslim Spiritual Attachment Scale (MSAS-U), while divergent validity was examined through factor loading using the Mental Health Inventory psychological well-being subscale. Data was analyzed using SPSS 26. Factor analysis revealed three factors, and the 51-item scale showed strong reliability (α=0.90). Factor 1, representing psychological distress with 19 items, had a Cronbach's alpha reliability of 0.89. Factor 2, representing spiritual distress with 15 items, had a reliability of 0.88, and Factor 3, representing social distress with 17 items, had a reliability of 0.87. The psychological distress subscale was highly correlated with the Mental Health Inventory's distress subscale ($p<.001$), social distress was negatively correlated with the Social Provision Scale ($p<.001$), and spiritual distress was negatively correlated with the Muslim Spiritual Attachment Scale ($p<.001$). Divergent validity was supported, as Mental Health Inventory well-being items loaded only onto a separate factor, confirming the scale's validity. The Multidimensional Distress Inventory for PCOS was found to be a precise and concise 51-item self-reporting tool developed to measure the psycho-socio-spiritual distress among women suffering from PCOS.

Keywords: *psychological, social, spiritual, distress, Muslim, women, polycystic ovary syndrome*

INTRODUCTION

Women's reproductive health is deeply impacted by conditions like polycystic ovary syndrome (PCOS), a hormonal disorder common among women of reproductive age. Polycystic Ovarian Syndrome (PCOS) is a prevalent endocrine condition that affects around 5-10% of reproductive-age women in developed countries (Deswal et al., 2020). The incidence of polycystic ovary syndrome (PCOS) is significantly greater among South Asian women (52%) as compared to the White population in the UK, which ranges from 20% to 25% (Zulfiqar et al., 2022). Polycystic ovarian syndrome is the primary cause of curable infertility, particularly prevalent among young women. It is responsible for ovulatory infertility in around 70% of cases (Zhuang et al., 2022). Due to hormonal imbalances and negative stigmas related to PCOS, women are at risk of experiencing other medical health problems like cardiovascular disease and diabetes alongside psychological, social and spiritual distress (Wekker et al., 2020; Light et al., 2021; Almhmoud et al., 2024; Munir et al., 2024). The social ramifications of PCOS are particularly profound, as the condition often disrupts interpersonal relationships, social roles, and community participation (Amini et al., 2014). Societal norms and expectations regarding femininity, particularly in relation to physical appearance, reproductive ability, and body image are often internalized by women and can become a source of considerable psychosocial distress when they remain unfulfilled due to PCOS symptoms such as hirsutism, obesity, acne, or infertility (Barry et al., 2011, Sadeeqa, 2018). Consequently, women with PCOS frequently experience feelings of shame, low self-esteem, social withdrawal, and stigmatization, all of which contribute to a diminished sense of self-worth and identity (Baye et al., 2023). These effects extend beyond superficial social discomfort, often resulting in isolation and reduced quality of life, necessitating a broader conceptual framework to understand and address the multidimensional challenges associated with the condition.

In this context, the bio-psycho-socio-spiritual model provides a comprehensive lens through which to understand the complex interplay of biological, psychological, social, and spiritual factors in chronic illness (Sulmasy, 2002). Unlike reductionist biomedical models that primarily focus on physiological symptoms and pharmacological treatments, this integrative framework underscores the importance of addressing the totality of human experience, particularly in chronic and life-altering conditions such as PCOS (Himelein & Thatcher, 2006).

Spirituality, within this model, is conceptualized as a critical resource that can contribute to meaning-making, emotional regulation, and resilience in the face of suffering (Puchalski et al., 2014). For many individuals, spiritual beliefs and practices provide not only a sense of existential coherence but also tangible coping mechanisms, such as prayer, community belonging, and reliance on a higher power, which may buffer against psychological distress associated with chronic health conditions (Koenig, 2012).

Empirical evidence supports this assertion, with several studies reporting that spirituality and religious engagement can enhance emotional well-being and foster adaptive coping strategies in patients with long-term illnesses (Naz, 2014; Thuné-Boyle et al., 2013). For example, spiritual connectedness has been shown to promote hope, facilitate acceptance, and reduce perceived burdens in individuals dealing with infertility (Mascarenhas et al., 2012), chronic pain (Rippentrop et al., 2005), or debilitating physical symptoms (Tarakeshwar et al., 2006). However, it is essential to acknowledge that the spiritual response to illness is neither uniform nor universally beneficial. Some individuals, particularly when confronted with prolonged suffering, loss of bodily control, or perceived divine injustice, may experience spiritual distress and it is characterized by feelings of abandonment by God, loss of faith, or a diminished sense of spiritual purpose (Naz, 2014; Exline et al., 2014). Such experiences can exacerbate psychological distress and complicate the clinical picture, thereby necessitating careful and culturally informed assessment (Pargament et al., 2001).

Psychological and social distress refer to emotional suffering caused by personal or environmental stressors, and their definitions are universally identical in recognizing the impact on mental and social well-being (Cuijpers et al., 2009; Mavaddat et al., 2014; Gómez-Gil et al., 2012; Astewle et al., 2023). The complexity of spiritual distress is further compounded by its highly contextual and culturally contingent nature (Dein, 2006). While psychological and social distress are relatively well-defined and widely understood across cultural settings, the construct of spiritual distress remains elusive, particularly because the meaning of spirituality itself varies significantly across religious and cultural traditions (Koenig, 2008). In Western, a non-Muslim society, a distinction is frequently made between spirituality and religiosity (Zinnbauer et al., 1997). Spirituality is often viewed as an individual and subjective experience involving a search

for meaning, purpose, and connection and sometimes independent of formal religious affiliation (Hill et al., 2000). Religiosity, on the other hand, tends to denote adherence to institutionalized doctrines, rituals, and collective religious practices (Koenig et al., 2012).

In contrast, the Islamic worldview conceptualizes spirituality and religiosity as fundamentally intertwined (Rasool, 2000). Spiritual development is seen as inherently tied to religious observance, and constructs such as Tawakkul (reliance on God), Sabr (patience), and Shukr (gratitude) are deeply embedded in Islamic teachings, offering a theologically grounded framework for interpreting suffering and adversity (Naz, 2014; Abu-Raiya & Pargament, 2011). Therefore, any assessment of spiritual distress among Muslim women with PCOS must be sensitive to the integrative nature of Islamic spirituality (Aflakseir & Coleman, 2011). Standardized Western tools that compartmentalize spirituality and religiosity may be inadequate or even misleading when applied in such contexts (Ghorbani et al., 2002). This underscores the urgent need for culturally and religiously congruent instruments that can accurately capture the spiritual dimension of distress as experienced within specific theological and cultural frameworks (Naz, 2014; Khan & Watson, 2006).

Moreover, the chronic and often unpredictable nature of PCOS symptoms necessitates a dynamic and ongoing approach to mental health care (Chaudhari et al., 2018; Cooney et al., 2017). Instead, continuous mental health screening and individualized psychosocial support should be integrated into the standard management protocols (Teede et al., 2018). Such interventions must be proactive and preventative, rather than reactive, in order to mitigate long-term psychological morbidity and enhance overall quality of life (Gibson-Helm et al., 2017). The development and utilization of specialized inventories that encompass the biological, psychological, social, and spiritual domains are therefore essential. These tools should be designed to not only identify symptomatology but also to contextualize distress within culturally relevant belief systems and life circumstances (Yilmaz & Goker, 2016). By doing so, clinicians can foster a more holistic and empathetic therapeutic alliance, enhancing treatment adherence and improving outcomes for women living with PCOS (Moran et al., 2010).

Existing instruments like the Polycystic Ovary Syndrome Quality of Life (Williams et al., 2018) and the Short Form Health Survey (SF-36) (Hays et al., 1993), offer valuable insights into

the physical and emotional health dimensions experienced by women with Polycystic Ovary Syndrome, but they often fall short in comprehensively capturing the intricate web of psychological, social, and spiritual factors that significantly contribute to the overall distress endured by this population (Bazarganipour et al., 2015). To address this gap, a new indigenous inventory was developed to assess the multidimensional distress experienced by Muslim women with PCOS. This reliable and valid tool will measure distress (psycho-socio-spiritual distress) on mild, moderate, and severe levels, and will help mental health professionals to make treatment plans according to women needs to enhance the quality of life. This study was a multistage research project conducted in the following three phases:

Phase I: Conceptualizing of spiritual distress among Muslim Population.

1. Phase II: Development of Multidimensional distress Inventory for Polycystic ovary syndrome-Urdu.
2. Phase III: Establishing the psychometric properties of newly developed Multidimensional distress Inventory for Polycystic ovary syndrome-Urdu through reliability and validity analysis.

METHOD

STUDY SITE

The present research used mixed method study design and was conducted in Pakistan. For the phase I; conceptualization of spiritual distress, 30 participants were taken for tor the 6 Focused Group Discussions. For the phase II & III the sample includes total 475 women suffering from PCOS. In the first phase 15 women were taken for the in-depth interview to obtain the information regarding distress in psychological, social and spiritual dimensions.60 women for tryout study, 200 women for run Exploratory factor analysis and establishing the psychometric properties of the newly developed scale and 200 women for run Confirmatory Factor Analysis.

ASSESSMENT MEASURE

DEMOGRAPHIC SHEET

The study utilized a demographic data sheet that included characteristics such as age, education level, socioeconomic status, marital status, weight, BMI, family history of illness, maternal history of illness, medication usage, and irregular menstrual periods.

MENTAL HEALTH INVENTORY-38-URDU

The Urdu translation and validation of the Mental Health Inventory was conducted by Mussarat and colleagues in 2018. The Urdu version consists of 38 items. The assessment included two subscales: Psychological Distress, which consisted of 22 items, and Psychological Well-being, which consisted of 16 items. The Mental Health Inventory (MHI) was evaluated using a 6-point rating scale, with 1 representing "all of the time" and 6 representing "none of the time". The scores for the Psychological Distress subscale varied from 22 to 132, whereas for the Psychological Well-being subscale, they ranged from 16 to 96. The Psychological Distress subscale was subject to negative scoring, meaning that higher scores on the total Mental Health Inventory (MHI) indicated greater mental health. The MHI demonstrated satisfactory reliability and robust internal consistencies, with values ranging from .83 to .96.

MUSLIM SPIRITUAL ATTACHMENT SCALE-URDU

Muslim Spiritual attachment Scale was originally developed by Miner in 2017 and it is translated and validated in Urdu language by Bareera Saeed in 2021. The M-SAS comprises dimensions representing cognitive working models of self and God as an attachment figure, and attachment behaviors. It consisted of six items and had 5 Likert type scoring system, ranging from 5=always. The score range of this scale is 6-30. The high scores indicate high level of spiritual attachment and low score indicates low spiritual attachment. The reliability of this scale is =0.87 (Saeed, 2021).

THE SOCIAL PROVISION SCALE-URDU

The Social Provisions Scale (Cutrona & Russell, 1987) is a 24-item survey that uses a 4-point Likert-type scale, with the highest scores indicating strongly agree and the lowest score indicating strongly disagree. In 2018, an Urdu translation was done by Rizwan & Syed. This is a reliable and valid scale that was created to evaluate perceived social support. The six provisions of social relationships are evaluated by this scale: opportunity for nurturance (providing assistance to others), reassurance of worth (recognition of one's competence), attachment (emotional closeness), social integration (a sense of belonging to a group of friends) and Guidance (it is the provision of advice or information). The scale's score range is from 24 to 96. A high score signifies substantial social support, whereas a low score indicates inadequate social support. Its alpha reliability is 0.83.

PROCEDURE

The cross-sectional validation study was conducted at the International Islamic University (IIU), Islamabad, Pakistan. After approval from the institutional review board of the IIU Department of Psychology, This study was conducted in Pakistan and the items were developed in Urdu. For the phase I, FGD's Protocol was established and by using the Thematic Analysis, the construct of Spiritual Distress were contextualized among Muslim Population. In the Phase II, on the basis of detailed literature review, theoretical models, more specifically bio psychosocial spiritual model (Sulmasy, 2002) an interview guide (Kallio et al., 2016) were prepared for the in-depth interview. The items in the interview protocol were related to psycho-socio-spiritual domain. The nature of questions was semi-structured so the participants have the opportunity to explain their answer openly (Seedat et al., 2014).The in-depth interviews were conducted with 15 women with the age range of 18-45 suffering from polycystic Ovary Syndrome (Diagnosed case) using purposive sampling. The researcher analyzed transcribed data through thematic analysis (Packer, 2016).

After the thematic analysis of in depth interviews and through literature review 126 items were generated for assessment of the Multidimensional distress among the women suffering from PCOS. Content validity was assessed through content validity Index and Content Validity Ratio (Egger, 2018). The 9 experts were invited to participate in the content validity study. A Lawshell (1975) criterion was selected for the content validity (Gilbert & Prion, 2016).The CVI-S for the entire tool was 0.92. Item CVI scores ranged from 0.28 to 1, and item CVR scores ranged from 0.33 to 1. 13 items with a low CVI score (<0.78) and low CVR score (<0.85) were removed from the tool and 113 were retain for further analysis. The scale was ready to administer along with its scoring key. Likert type scoring was used in scale consisting of five response categories. The response category were labeled and scored as 1=never 2=rarely, 3=seldom, 4=often, 5=always. The tryout study was conducted to investigate the language validation. 60 women (N=30 married, N=30 Unmarried) were initially selected to check the comprehension and wordings of the items. The reliability analysis demonstrates that the Multidimensional distress Inventory for Polycystic ovary syndrome-Urdu has an acceptable reliability coefficient that is 0.78, indicating that the scale is reliable and suitable for usage with the research sample. After the tryout study scale was ready for the administration on large sample to establish it's psychometric of the newly developed scale. In phase III, a purposive sample of 200 (N=100 married, N=100 unmarried) women afflicted with Polycystic Ovary

Syndrome (PCOS), aged between 18 and 45 years, was selected for data collection from the private clinics and hospitals of the cities of Rawalpindi and Islamabad. The data was chosen via purposive sampling. The medical records were used to filter the data for PCOS. The women were diagnosed by six months and were on medication. Women that participated had education level from Matric to PhD. Married and Unmarried women were also included in the study. The exclusion area was females not suffering from PCOS or not taking any medication were less than 18 years and could not read the Urdu language. Females under 18 years and not willing to respond to questions were excluded. The research did not include women with any physical disability. To assess the internal consistency of MDDI-PCOS-U, inter item correlation was used. The forty items showed low correlation (<.30) (Nikpour et al., 2020) so author decided to discarded the forty items were deleted from the scale. The remaining 73 items were shows good inter-item correlation. Normality check was conducted to identify the outliers in the data. Items had SD lower than 0.5 and greater than 1.5, 22 items were discarded (Field, 2009). After both steps 51 items were finalize for the next step. The chornbach alpha of the 51 item scale was 0.90, displayed significant inter item correlation and a range of correlation coefficients from .41 to .86, indicating that the items are in agreement with the overall total score of MDDI-PCOS-U. This establishes the sample's scale's homogeneity and internal consistency (construct validity). The adequacy of the sample was measure through Kaiser-Meyer-Olkin (KMO) that was 0.84, that confirms that sample is suitable for factor analysis (Amin, 2020). The Bartlett's test of sphericity yielded a significant result too (11151.47, p<.001) (Worthington & Whittaker, 2006). The Principal Component Analysis with oblimin rotation was applied to a set of 51 items from the Multidimensional distress Inventory for Polycystic ovary syndrome-Urdu (MDDI-PCOS-U). This three factor structure of distress scale was put to test by confirmatory factor analysis by using AMOS-26.

Convergent validity and divergent validity of the recently developed Multidimensional distress inventory were determined by using three standard measures: the Spiritual Attachment Muslim Scale-Urdu (Saeed & Haneef, 2021) the Social Provision Scale-Urdu, Psychological distress Subscale and psychological well-being subscale of the Mental Health Inventory-38-Urdu (Khan et al., 2015). The mental health inventory –Urdu consisted of 38 items measuring mental health having tow subscales, Psychological Distress and Psychological Well-being on 6 point likert scale, with score ranges for psychological distress is from 22 to 132, whereas for the

Psychological Well-being subscale, they ranged from 16 to 96. Muslim Spiritual attachment Scale-Urdu is 6 item scale measuring attachment with God, and attachment behaviors on 5 likert type scoring with the score of 6-30. The Social Provisions Scale-Urdu (Rizwan & Syed, 2010) is a 24-item survey that uses a 4-point Likert-type scale, with the scoring range of 24-96.

DATA ANALYSIS

For the qualitative part, thematic analysis were used to identified the major and subthemes from the in-depth interviews while for the quantitative part the data was analyzed by SPSS 26. For the Demographic variables, frequencies and percentages were calculated. Exploratory Factor analysis and Confirmatory Factor analysis were used for the in the scale development phase. The psychometric properties of the scale were established by Alpha Reliability analysis, Pearson correlation, and divergent and convergent validity analysis.

ETHICAL ISSUE

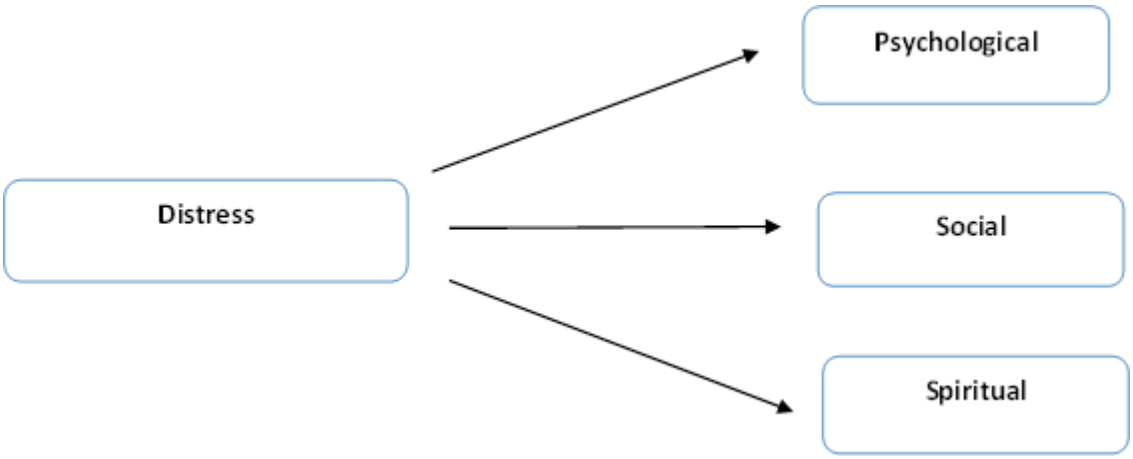
Before completing the questionnaires, the subjects were provided with informed consent. The ethical review board of the International Islamic University in Islamabad, Pakistan, accepted the current research.

RESULTS

QUALITATIVE RESULTS

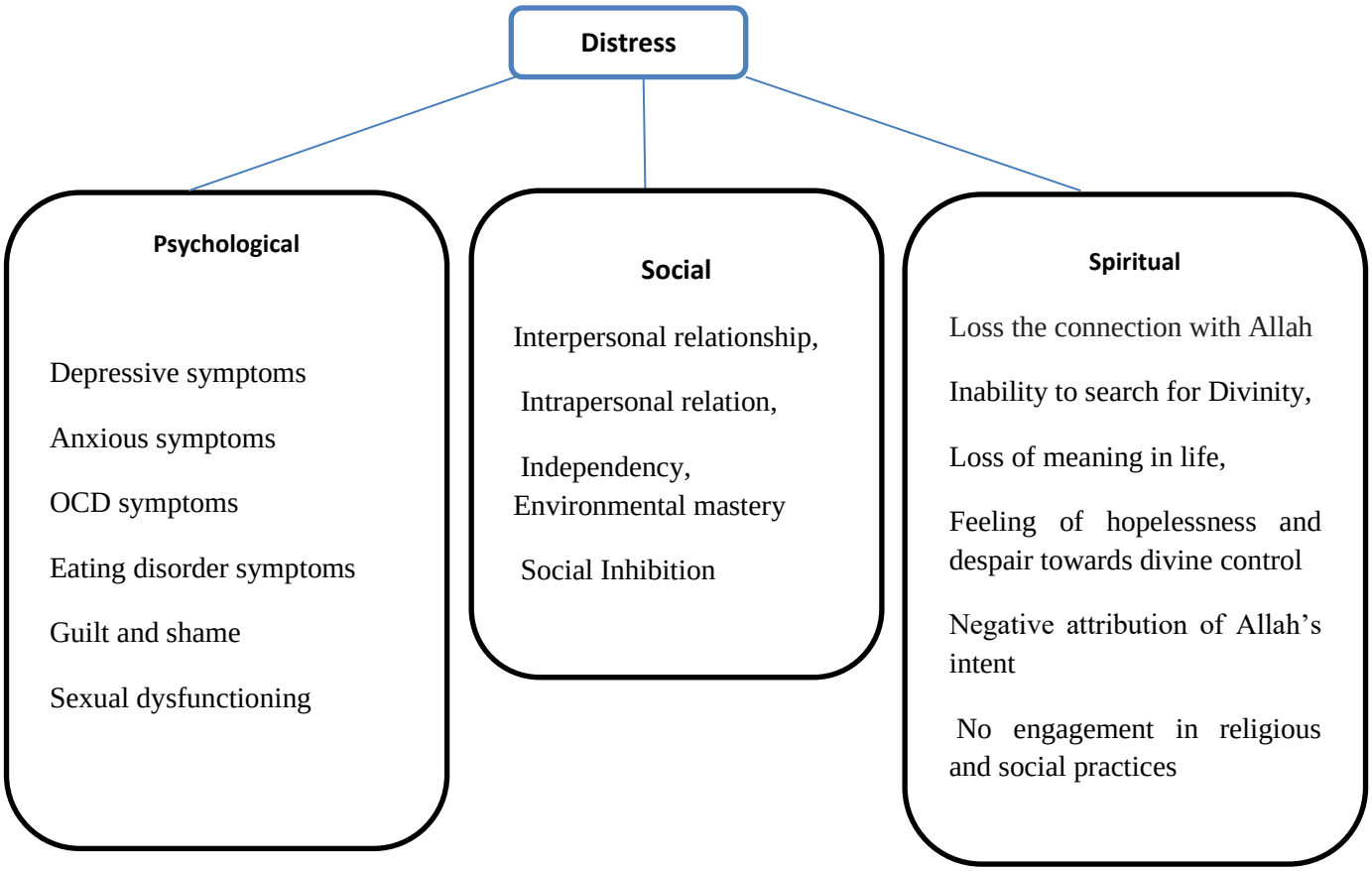
Thematic analysis shows three major themes (Psychological, Social, and Spiritual) with sub-themes categories depressive symptoms, Anxiety symptoms, OCD symptoms, Eating disorder symptoms, Guilt and shame, Sexual dysfunctioning, Self-esteem, Interpersonal relationship, Intrapersonal relation, independency, environmental mastery, social anxiety, Loss Feeling of presence sense of connectedness with Allah, inability to search for Divinity, loss meaning in life, feeling of hopelessness and despair towards divine control, negative attribution of Allah's intent and no engagement in religious and social practices.

MAJOR CATEGORIES OF DISTRESS



Note. Major Categories of Distress, Own work

SUBCATEGORIES OF MAJOR THEMES OF DISTRESS



Note. Subcategories of Major themes of Distress. Own work

QUANTITATIVE RESULTS

Table 1

Descriptive analysis of sample characteristics of study (N=200)

Variables	Categories	Frequency	Percentage
Age range (M±SD)	27.32±1.27 years		
	18-30	72	36
	31-45	128	64
Working Status			
	Working	108	54
	Non-working	92	46
Education			
	Matric	44	22
	Under Graduate	101	50.5
	Post Graduate	55	27.5
Marital status			
	Married	100	50
	Unmarried	100	50
PCOS in Family			
	Yes	160	80
	No	40	20
PCOS in Mother			

	Yes	112	56
	No	88	44
Socio-economic Status			
	Lower	68	34
	Middle	70	35
	Higher	62	31

Note. f=frequency, M=Mean, SD=Standard Deviation

Out of 200 women suffering from PCOS, 100(50%) were married and 100(50%) were unmarried. The overall mean age was 27.32±1.27 years. 72(36%) females were belong to age group 31-45 and 128(64%) were belong to the age group 18-30. 92(46%) women were non-working and 108(54%) were working.

Table 2

Eigen Values and Percentage Variances explained by three Factors for Multidimensional distress Inventory for Polycystic ovary syndrome-Urdu (MDDI-PCOS-U) (N=200)

Factors	Eigen Values	% of Variance	Cumulative %
F1(Psychological distress)	13.848	27.153	27.153
F2(Spiritual distress)	10.900	21.373	48.526
F3(Social distress)	3.367	6.602	55.128

Table 2 depicts Eigen values and variances explained by three factors for the newly developed scale. Direct oblimin method provided three-factor solutions for 51 items. Factor 1 (Psychological distress) has an Eigen value of 13.84, which accounts for 27.15% of the total variance. This is the highest number among the three factors. Factor II (Spiritual Distress) has an Eigen value of 10.90, accounting for 21.37% of the total variation. Factor III (Social Distress)

has an Eigen value of 3.36, explaining 6.60% of the total variance. According to the results, 55.12% of the variation is explained by the three components together.

Table 3

Factor loading of Multidimensional distress Inventory for Polycystic ovary syndrome-Urdu (MDDI-PCOS-U) (n=200)

Items No	F1 Psychological distress	F2 Spiritual Distress	F3 Social Distress
Q2	0.21	0.32	0.54
Q3	0.11	0.24	0.39
Q5	0.23	0.41	0.53
Q6	0.28	0.18	0.50
Q7	0.13	0.32	0.56
Q10	0.23	0.83	0.10
Q13	0.22	0.38	0.59
Q14	0.28	-0.33	0.75
Q15	0.26	0.42	0.61
Q16	0.31	0.47	0.74
Q17	0.18	0.29	0.56
Q19	0.32	-0.40	0.54
Q20	0.31	-0.37	0.60
Q29	0.25	0.83	0.43
Q30	0.51	0.79	0.12
Q31	0.27	0.54	0.67
Q32	0.33	0.41	0.75
Q36	0.24	0.42	0.60
Q38	0.54	0.78	0.35
Q39	0.32	0.54	0.41
Q40	0.34	0.57	0.31
Q41	0.30	0.49	0.34
Q42	0.17	0.66	0.18
Q43	0.57	0.32	0.45
Q44	0.74	0.32	0.19
Q45	0.67	0.43	0.52
Q49	0.70	0.51	0.44
Q50	0.76	0.32	0.21
Q51	0.61	0.52	0.37
Q53	0.51	0.39	0.43
Q60	0.31	0.46	0.52
Q61	0.46	0.79	0.53
Q62	0.36	0.85	0.52
Q63	0.68	0.22	0.24
Q64	0.46	0.89	0.54
Q65	0.41	0.85	0.54

Q66	0.56	0.42	0.25
Q67	0.64	0.18	0.21
Q68	0.42	0.65	0.23
Q71	0.49	0.62	0.25
Q72	0.80	0.53	0.42
Q74	0.63	0.44	0.32
Q75	0.19	0.74	0.32
Q77	0.71	0.48	0.57
Q80	0.66	0.64	0.32
Q81	0.60	0.43	0.36
Q84	0.57	0.23	0.47
Q86	-0.46	0.37	0.45
Q90	0.49	-0.33	0.35
Q93	0.37	-0.40	0.54
Q101	0.48	-0.41	0.32

Table 3 indicates the 3 factors of Multidimensional distress Inventory for Polycystic ovary syndrome-Urdu (MDDI-PCOS-U). The Three factors were considered three sub-scales for the questionnaire. Factor 1 measures Psychological Distress among women suffering from PCOS and this factor has 19 items. Factor 2 is related to Spiritual Distress comprising of 15 items. Factor 3 is related to Social Distress and it consists of 17 items.

Table 4

Psychometric properties of Multidimensional distress Inventory for Polycystic ovary syndrome-Urdu (MDDI-PCOS-U), Mental Health Inventory-38-Urdu(MHI-U), Social Provision Scale-Urdu (SPS-U) and Muslim Spiritual Attachment Scale-Urdu (MSAS-U) (N=200)

Scale	K	M(SD)	α	Ranges		Skewness	Kurtosis
				Potential	Actual		
MDDI-PCOS	51	162.54(19.65)	.90	51-255	128-218	0.44	.87
PD	19	46.32(6.32)	.89	19-95	24-79	.87	.76
SD	17	43.61(10.55)	.87	17-85	30-71	-.51	.62
SiD	15	45.76(7.15)	.88	15-75	23-64	0.21	.64
MHI-38	38	112.21(7.41)	.90	38-228	51-152	0.13	-1.46
Psy D	22	64.35(14.35)	.74	22-132	25-98	-.30	0.47
Psy W	16	58.91(16.07)	.89	16-96	20-51	.12	0.66

SPS	24	60.58(15.77)	.87	24-96	26-61	0.23	0.13
MSAS	16	48.61(11.54)	.85	16-80	17-48	0.25	0.72

Note. MDDI-PCOS= Multidimensional distress Inventory for Polycystic ovary syndrome, PD= Psychological Distress, SD= Social Distress, SiD= Spiritual Distress, MHI-38= Mental Health Inventory-38, Psy D= Psychological Distress (Subscale of MHI-38), Psy W= Psychological Wellbeing (sub Scale of Mental Health Inventory-38, SPS= Social Provision Scale, MSAS= Muslim Spiritual Attachment Scale. k=no of Items

Table 4 elucidates psychometric properties of all study scales. Alpha coefficient of 51 items is 0.90. The mean value of the scale was 162.54±19.65. The standardized skewness value was 0.44 ($p > 0.001$), and the kurtosis value was 0.87 ($p > 0.001$), with the scale ranging from 51 to 255. Subscale psychological distress has Cronbach's alpha reliability of 0.89, social distress with 17 items, had a reliability of 0.87 and spiritual distress with 15 items, had a reliability of 0.88. These values indicate high internal consistency and acceptable reliability for the overall scale and its subscales.

Table 5

Item-total correlation for Multidimensional distress Inventory for Polycystic ovary syndrome-Urdu 51-Items (N=200)

Item No.	Item-Total Correlation	Item No.	Item-Total Correlation
Q2	.77***	Q32	.61***
Q3	.37***	Q36	.78***
Q5	.46***	Q38	.77***
Q6	.66***	Q39	.75***
Q7	.86***	Q40	.74***
Q10	.55***	Q41	.71***
Q13	.41***	Q42	.62***
Q14	.78***	Q43	.74***
Q15	.78***	Q44	.73***
Q16	.13***	Q45	.86***
Q17	.82***	Q49	.86***
Q19	.73***	Q50	.66***
Q20	.72***	Q51	.74***
Q29	.41***	Q53	.66***
Q30	.61***	Q60	.73***
Q31	.74***	Q61	.84***
Q32	.31***	Q62	.84***

Q36	.71***	Q63	.76***
Q38	.75***	Q64	.73***
Q39	.86***	Q65	.74***
Q40	.81***	Q66	.71***
Q32	.63***	Q86	.72***
Q36	.78***	Q90	.82***
Q38	.78***	Q93	54***
Q39	.52***	Q101	66***
Q40	.61***		

Note. ****p<.001*

Table 5 depicted the Item total correlation for MDDI-PCOS-U. It ranged from .41 to .86, indicating that the items are in agreement with the overall total score of MDDI-PCOS-U, p<0.001.

Table 6

Correlation Coefficients between Multidimensional distress Inventory for Polycystic ovary syndrome-Urdu, Mental Health Inventory-38-Urdu, Social Provision Scale-Urdu and Muslim Spiritual Attachment Scale-Urdu (n=200)

		1	2	3	4	5	6
1	SpD	-					
2	PD	.74***	-				
3	SD	.77***	.76***	-			
4	SPS	-.71***	-.77***	-.84***	-		
5	MSAS	-.85***	-.78***	-.89***	.87***	-	
6	PsyD	-.78***	-.84***	-.77***	.72***	.75***	-

Note. PD=Psychological distress; SD= social Distress; SpD= Spiritual Distress; SPS= Social Provisional scale, MSAS= Muslim Spiritual Attachment Scale, PsyD- Mental Health Inventory psychological distress Sub scale***p<0.001

The table 6 indicates that both the Multidimensional distress Sub scale Psychological distress is highly correlated with the Psychological distress sub-scale of Mental Health Inventory r=-.78, p<.001. The result also elucidates Multidimensional distress-Urdu Sub-scale Social distress is highly correlated with the Social Provision scale-Urdu r=-.77, p<.001. The result also elucidates Multidimensional distress-Urdu Subscale Spiritual distress is highly correlated with the Muslim Spiritual Attachment Scale-Urdu r=-.85, p<.001. This indicates that the newly developed inventory Multidimensional distress-Urdu (PSSDI-Urdu) has good convergent validity.

Table 7

Correlation Coefficients between Multidimensional distress Inventory for Polycystic ovary syndrome-Urdu and Mental health inventory -38 sub scale Psychological well-being (N=200)

Scales	1	2
Multidimensional distress Inventory for Polycystic ovary syndrome -Urdu	-	-0.73***
Psychological wellbeing Subscale (Mental Health Inventory-38)-Urdu	-	-

*Note. ***p<0.001*

Table 7 indicates that Multidimensional distress Inventory for Polycystic ovary syndrome-Urdu and Psychological wellbeing Subscale of Mental Health Inventory-38 -Urdu measure different constructs which indicates that the newly developed scale Multidimensional distress-Urdu has good divergent validity.

Table 8

Cross loading of Multidimensional distress Inventory for Polycystic ovary syndrome-Urdu and Mental health Inventory-38 sub Scale Psychological Wellbeing (N=200)

Item No	F1	F2	F3	F4
Q2	0.21	0.32	0.54	0.21
Q3	0.11	0.24	0.39	0.11
Q5	0.23	0.41	0.53	0.23
Q6	0.28	0.18	0.50	0.28
Q7	0.13	0.32	0.56	0.13
Q10	0.23	0.83	0.10	0.23
Q13	0.22	0.38	0.59	0.22
Q14	0.28	-0.33	0.75	0.28
Q15	0.26	0.42	0.61	0.26
Q16	0.31	0.47	0.74	0.31
Q17	0.18	0.29	0.56	0.18
Q19	0.32	-0.40	0.54	0.32
Q20	0.31	-0.37	0.60	0.31
Q29	0.25	0.83	0.43	0.25
Q30	0.51	0.79	0.12	0.51
Q31	0.27	0.54	0.67	0.27
Q32	0.33	0.41	0.75	0.33
Q36	0.24	0.42	0.60	0.24
Q38	0.54	0.78	0.35	0.54
Q39	0.32	0.54	0.41	0.32
Q40	0.34	0.57	0.31	0.34
Q41	0.30	0.49	0.34	0.30
Q42	0.17	0.66	0.18	0.17
Q43	0.57	0.32	0.45	0.57
Q44	0.74	0.32	0.19	0.74
Q45	0.67	0.43	0.52	0.67

Q49	0.70	0.51	0.44	0.70
Q50	0.76	0.32	0.21	0.76
Q51	0.61	0.52	0.37	0.61
Q53	0.51	0.39	0.43	0.51
Q60	0.31	0.46	0.52	0.31
Q61	0.46	0.79	0.53	0.46
Q62	0.36	0.85	0.52	0.36
Q63	0.68	0.22	0.24	0.68
Q64	0.46	0.89	0.54	0.46
Q65	0.41	0.85	0.54	0.41
Q66	0.56	0.42	0.25	0.56
Q67	0.64	0.18	0.21	0.64
Q68	0.42	0.65	0.23	0.42
Q71	0.49	0.62	0.25	0.49
Q72	0.80	0.53	0.42	0.80
Q74	0.63	0.44	0.32	0.63
Q75	0.19	0.74	0.32	0.19
Q77	0.71	0.48	0.57	0.71
Q80	0.66	0.64	0.32	0.66
Q81	0.60	0.43	0.36	0.60
Q84	0.57	0.23	0.47	0.57
Q86	-0.46	0.37	0.45	-0.46
Q90	0.49	-0.33	0.35	0.49
Q93	0.37	-0.40	0.54	0.37
Q101	0.48	-0.41	0.32	0.48
MH1	0.32	0.17	0.28	0.52
MH2	0.19	0.15	0.22	0.52
MH3	0.12	0.31	0.34	0.79
MH4	0.13	0.24	0.15	0.48
MH5	0.24	0.31	0.25	0.81
MH6	0.11	0.26	0.27	0.77
MH7	0.24	0.21	0.31	0.76
MH8	0.22	0.25	0.31	0.72
MH9	0.41	0.22	0.23	0.82
MH10	0.25	0.42	0.45	0.79
MH11	0.26	0.31	0.41	0.77
MH12	0.11	0.26	0.25	0.69
MH13	0.21	0.32	0.41	0.70
MH14	0.33	0.12	0.21	0.72
MH15	0.34	0.26	0.31	0.77
MH16	0.22	0.16	0.48	0.75

The result of table 8 Indicated that Metal Health Inventory Subscale Psychological wellbeing items are loaded only factor 3 that indicated its Multidimensional distress Inventory for Polycystic ovary syndrome-Urdu has a good Divergent validity with Psychological wellbeing Sub Scale of MHI 38-Urdu.

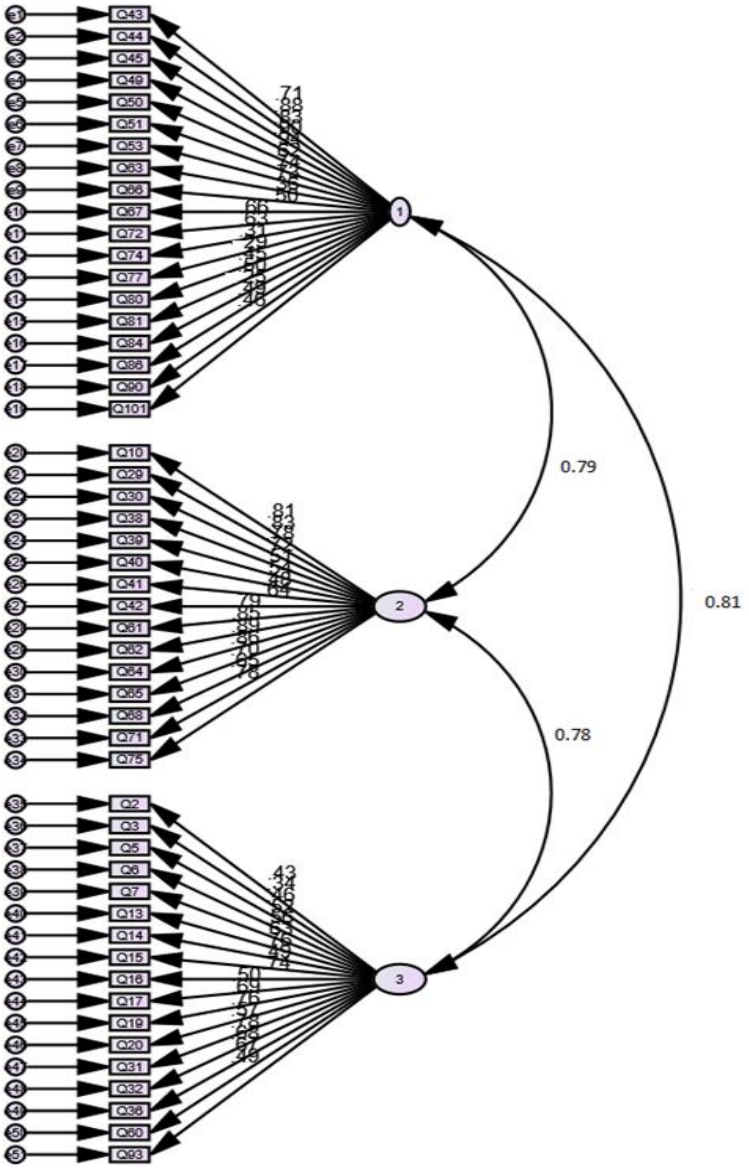
Table 9

Stepwise Model Fit Indices for CFA of MDDI-U (N = 200)

Models	χ^2	df	χ^2/df	GFI	CFI	NFI	RMSEA
Model 1 (51 items first order)	2921.04	1221	2.39	.90	.89	.87	.07
Model2 (51 items Second order)	2961.82	1178	1.76	.90	.95	.95	.08

The stepwise model fit indices was applied for confirmatory factor analysis of the Multidimensional distress Inventory-Urdu (MDDI-U). Model 1 describes CFA results where 51 indicators loaded on their respective first-order factors, and the Model 2 described three first-order factors converged on the superordinate construct of distress. The second model depicted that the chi-square to degrees of freedom ratio was 1.76, which is below the permitted threshold. Additionally, several model fit indices exhibited a remarkable correspondence between the data and the model. The CFI, GFI, and NFI values all above the threshold of .90, indicating that they satisfy the rigorous fit index standards. The RMSEA value is 0.08, which is significantly lower than the cutoff criterion of 0.05. The chi-square difference test suggested that model two is slightly better than model one.

Figure 1: Pictorial view of CFA



DISCUSSION

Polycystic Ovary Syndrome (PCOS) is a multifaceted endocrine disorder that not only presents with physical and reproductive health complications but also imposes significant psychological, social, and spiritual burdens on affected women. While existing assessment tools such as the PCOSQ (Williams et al., 2018) and the SF-36 (Hays et al., 1993) are widely used to evaluate the psychophysiological aspects of PCOS, these instruments predominantly focus on medical and physical health parameters. As a result, they fail to comprehensively address the psychological, social, and spiritual dimensions of distress often experienced by women, particularly in culturally and religiously sensitive populations like that of Muslim women in Pakistan.

In light of this gap, the present study aimed to develop an indigenous, culturally and religiously relevant inventory titled the Multidimensional Distress Inventory for Polycystic Ovary Syndrome-Urdu (MDDI-PCOS-U). This inventory was specifically designed to assess the psychological, social, and spiritual distress experienced by Muslim women suffering from PCOS. The goal was to provide mental health practitioners with a valid and reliable tool that could not only capture the multidimensional impact of PCOS but also guide the formulation of individualized therapeutic interventions.

The final version of the MDDI-PCOS-U consists of 51 items distributed across three subscales: psychological distress (19 items), social distress (17 items), and spiritual distress (15 items). The scale demonstrated excellent internal consistency, with a composite Cronbach's alpha of 0.90. Subscale reliability coefficients were also high (0.89) for psychological distress, (0.88) for social distress, and (0.87) for spiritual distress indicating that each subscale reliably measures its respective construct. Few items were reverse-coded to reduce response bias and enhance accuracy.

The inventory allows for both composite and subscale scoring. The overall score can range from 51 to 255. At the subscale level, psychological distress scores range from 19 to 95, social distress from 17 to 85, and spiritual distress from 15 to 75. These scores are further categorized to reflect the severity of distress: scores from 51–119 indicate mild distress, 120–187 suggest moderate distress, and 188–255 denote high levels of multidimensional distress. These distinctions are intended to help clinicians identify the intensity of distress and develop targeted interventions accordingly.

The MDDI-PCOS-U is among the first culturally sensitive tools developed to assess the holistic experience of distress among Muslim women with PCOS. Developed in Urdu, it is accessible to a large segment of the Pakistani population and is particularly relevant in contexts where religious and cultural factors play a significant role in a woman's perception and management of illness. By addressing the psychological, social, and spiritual domains simultaneously, this instrument facilitates a more comprehensive understanding of patient experiences and needs.

Despite its strengths, the study has certain limitations. The sample used for validation primarily included educated women from urban settings, which limits the generalizability of the findings. Future research should incorporate a more diverse population, including women from

rural and underserved backgrounds, to enhance the representativeness of the results. Additionally, the scale is currently limited to Urdu-speaking Muslim women in Pakistan. To extend its applicability, future studies should consider validating the scale in other Muslim-majority countries with Urdu-speaking populations.

Moreover, the MDDI-PCOS-U was developed within an Islamic framework, which may restrict its use among women of other religious backgrounds. Future adaptations of the inventory could consider revising or supplementing items to align with the spiritual frameworks of other faiths, making the tool more inclusive. Translation and validation of the instrument into other languages such as English, Arabic, and Persian could further enhance its utility for broader regional and international use.

The MDDI-PCOS-U represents a significant step forward in the psychological assessment of PCOS-related distress among Muslim women. It offers a reliable, valid, and culturally informed means of identifying the psychological, social, and spiritual needs of patients. Its implementation in clinical settings can enable mental health professionals to develop more effective and individualized care plans, ultimately improving the quality of life and mental well-being of women coping with PCOS.

CONCLUSION

The MDDI-PCOS-U has been identified as a valid and reliable self-report instrument for assessing the multidimensional constructs of psychological, social, and spiritual distress among women diagnosed with Polycystic Ovary Syndrome.

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