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URDU TRANSLATION AND PRELIMINARY PSYCHOMETRIC EVALUATION OF THE MENTAL FATIGUE SCALE IN PAKISTANI WOMEN WITH POLYCYSTIC OVARY SYNDROME

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ABSTRACT

The present study was conducted on the translation and preliminary psychometric assessment of the Mental Fatigue Scale (MFS) in the Urdu language. The scale was originally developed by Johansson et al. (2010) and further evaluated by Johansson and Rönnbäck (2014). The translation process was carried out through forward and backward translation, with reconciliation and qualitative item review completed by a panel of bilingual and subject experts. Permission for use and translation was obtained from the original author. The translated version was subsequently administered to 60 women diagnosed with polycystic ovary syndrome (PCOS) by a gynaecologist, recruited through purposive sampling from public and private hospitals in Punjab, Pakistan. Respondents' ages ranged from 15 to 45 years (M = 23.97, SD = 3.74). Cronbach's alpha reliability of the Urdu MFS was examined along with item-total statistics and inter-item correlations. The reliability coefficient (α = .852) indicates its reliable status, and the mean inter-item correlation was .298. Corrected item-total correlations ranged from .207 to .719, with eleven of the fourteen items obtaining values of .44 or above. Scores were also examined against the recommended cut-off of 10.5 and in relation to cognitive failures and psychological well-being. The scale provides a useful tool for clinicians and researchers assessing mental fatigue among Urdu-speaking women with PCOS.

I. INTRODUCTION

Mental health is a vital component of overall health, and reproductive endocrine conditions are among the physical conditions most closely linked to it. Polycystic ovary syndrome (PCOS) is the most common endocrine disorder of the reproductive years. According to the Global Burden of Disease Study 2021, prevalent cases among women of childbearing age rose from 34.81 million in 1990 to 65.77 million in 2021 (Meng et al., 2025). In Pakistan the burden is considerable; a recent study of adolescent girls in urban and rural Punjab reported an overall prevalence of 26.7% (Aslam et al., 2025). The 2023 International Evidence-based Guideline for the Assessment and Management of Polycystic Ovary Syndrome identifies emotional well-being as a core domain of care and recommends attention to psychological symptoms in all women with the condition (Teede et al., 2023).

Women with PCOS carry a substantial psychological burden, and evidence from Pakistan makes this clear. Zahid and Javed (2025) found that mental fatigue and cognitive difficulties were strongly related to poor psychological well-being in Pakistani women with PCOS, with mental fatigue emerging as the primary predictor of lower overall emotional health. Tariq (2024), working in a tertiary care hospital in Islamabad, reported anxiety in 20.3% and depression in 17.6% of 74 women with the condition. Among 213 Pakistani girls and young women aged 15 to 24 years, Peerwani et al. (2023) found that those screening positive for depressive symptoms reported substantially lower quality of life, and that this gap widened with each additional year since diagnosis. In a larger sample of 583 married women attending a district hospital in southern Punjab, Hassan et al. (2025) showed that culturally specific pressures surrounding childbearing were associated with higher depression and anxiety scores, which suggests that the emotional consequences of PCOS in Pakistan are shaped by social expectation as well as by the condition itself. These local findings sit alongside a systematic review and meta-analysis of 40 studies conducted in low- and middle-income countries, which reported a pooled prevalence of 51% for depressive symptoms and 45% for anxiety symptoms (Atinga et al., 2025). Alongside mood, cognition has received increasing attention. A recent systematic review and meta-analysis reported alterations in cognitive function among reproductive-age women with PCOS (Rogers et al., 2026), and narrative reviews have discussed hyperandrogenism, insulin resistance and chronic low-grade inflammation as possible mechanisms (Saei Ghare Naz et al., 2023). Fatigue has also been shown to affect work performance in this population (Bajpai et al., 2024).

The complaint frequently described by women with PCOS is not general tiredness but mental exhaustion that follows cognitive effort and takes a disproportionately long time to recover from, accompanied by slowed thinking, concentration and memory difficulties, irritability, and sensitivity to light and noise. Johansson et al. (2010) described this cluster as mental fatigue and developed the Mental Fatigue Scale to assess it. In Pakistan, Urdu is the national language and the medium in which most patients present to health services. Administering an English-language instrument to respondents with varying levels of English literacy introduces measurement error, so there is a clear need to translate or adapt instruments that are already available. Pakistani researchers have begun to meet this need for related constructs. Jibeen and Khalid (2012) cross-validated an Urdu translation of Ryff's Scales of Psychological Well-Being; Nazir et al. (2024) translated and cross-culturally validated the Neurological Fatigue Index into Urdu for stroke patients following Beaton and COSMIN procedures; and Zaman et al. (2024) produced an Urdu version of the Modified Polycystic Ovary Syndrome Health-Related Quality of Life Questionnaire in a sample of 180 Pakistani women with PCOS, reporting a Cronbach's alpha of .97. No Urdu version of the Mental Fatigue Scale is available. The present paper therefore aimed to translate the MFS into Urdu and to examine its reliability in a sample of Pakistani women with PCOS.

The Mental Fatigue Scale (MFS)

The Mental Fatigue Scale was developed in Sweden by Johansson et al. (2010) and was further evaluated by Johansson and Rönnbäck (2014). It is a self-assessment questionnaire for mental fatigue and related symptoms. The scale consists of 15 items. The first 14 items are scored and cover 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, sensitivity to noise, and decreased or increased sleep. The fifteenth item concerns variation in symptoms over a 24-hour period and is not included in the total score. Each of the 14 scored items presents a question followed by four descriptive rating options with examples, scored 0 to 3, with half-point options in between, giving seven response levels in all. The whole-point options carry the following meaning: 0 = no problem, 1 = slight problems, 2 = fairly serious problems, and 3 = serious problems. The total score therefore ranges from 0 to 42. Johansson and Rönnbäck (2014) have suggested a cut-off score of 10.5, a score above which reflects the presence of fatigue-related problems. The descriptive response options are statements describing aspects of real-life situations that respondents may identify with, which reduces the reading demand of the instrument. The reliability coefficient reported for the original version was $\alpha = .944$. The scale has since been used in cerebral palsy (Bergqvist et al., 2020) and has recently been adapted into Turkish, where a reliability coefficient of $\alpha = .88$ was reported (Soylu et al., 2026).

II. METHOD

Step 1: Preparation

Prior to translation, written permission to translate and adapt the MFS into Urdu was obtained from the original developer(s) of the scale. A concept-definition document was then prepared, in which the construct underlying each item, the intended meaning of key terms, and the response format were specified. This document was provided to all translators to ensure a shared understanding of the source instrument before independent translation began (Acquadro et al., 2008).

Formulation of the Expert Panel

An expert panel was constituted comprising three bilingual forward translators, one independent back translator with expertise in the English language, the research supervisor (a lecturer in clinical psychology with experience in test adaptation), and the researcher. All translators were native speakers of Urdu with command of both English and Urdu, were familiar with the cultures of both English-speaking countries and Pakistan, and had experience in the content area of the research (Acquadro et al., 2008).

Step 2: Forward Translation

Three bilingual translators were provided with the original English version of the MFS and the concept-definition document, and each translated the scale into Urdu independently of the others. Translators were instructed to render the items in natural and acceptable language suitable for the broadest possible audience, and to keep their formulations simple, clear, and concise (Acquadro et al., 2008).

Step 3: Reconciliation

A reconciliation meeting was convened, in which the three forward translations were compared and evaluated against the English version of the MFS in terms of conceptual equivalence, comprehensibility and clarity of expression. The panel examined each item in turn, giving particular attention to linguistic and cultural differences that could impede the transfer of meaning from English into Urdu. Semantic, idiomatic, experiential and conceptual equivalence were used as the criteria for evaluation (Beaton et al., 2000). For each item the panel selected the most appropriate translation or, where none of the three was judged adequate, proposed an alternative wording. Decisions were reached by consensus; where consensus could not be reached, the supervisor made the final determination. The panel's judgements were documented item by item, and the resulting Reconciled Forward Translation comprised the best-fitting Urdu rendering of each item (Acquadro et al., 2008).

Step 4: Back Translation

The Reconciled Forward Translation was then translated back into English by an independent translator with expertise in the English language, who had not been involved in the earlier stages and who was blind to the original English version of the scale. The purpose of this step was to assess the conceptual equivalence of the Urdu version with the English source (Acquadro et al., 2008).

Step 5: Back-Translation Review

The back-translated version was compared item by item with the original English MFS by the researcher and the supervisor, with attention directed to conceptual rather than literal differences. Where a back-translated item diverged in meaning from its English source, the corresponding Urdu item was revised and, where necessary, re-examined by the panel. This process yielded the Final Forward Translation (Acquadro et al., 2008). Permission was obtained from the original author of the scale by email before the study began, both for the use of the instrument and for its translation into Urdu.

Step 6: Pre-testing

After the development of the Final Forward Translation document, a pre-test was carried out to assess the comprehensibility of the instructions, the items and the descriptive response options. On the basis of this pre-test the final Urdu draft was prepared, and the psychometric properties of the translated scale were then examined in the main study.

Step 7: Complete Study

Participants

The sample consisted of 60 women diagnosed with PCOS by a gynaecologist according to the criteria of the National Institute of Child Health and Human Development and the National Institutes of Health. Data were collected through non-probability purposive sampling from private and public hospitals and clinics of Punjab. The age of respondents ranged from 15 to 45 years (*M* = 23.97, *SD* = 3.74). Women whose PCOS had resolved, women with any other diagnosed mental health condition, and women with any other medical illness such as endometriosis, type 2 diabetes mellitus, cardiovascular disease or hypertension were not included in the sample.

Measures

A demographic information questionnaire constructed in Urdu recorded age, education, profession, family income, marital status, number of children, area of living, family system, menstrual cycle, weight, height, body mass index, year of diagnosis, duration of illness, duration of treatment, and the hospital or clinic attended. In addition to the Urdu MFS, the Cognitive Failures Questionnaire (Broadbent, Cooper, FitzGerald, & Parkes, 1982), a 25-item self-report measure of everyday lapses in perception, memory and motor function, was administered in an Urdu translation prepared by the researcher through the same procedure, no published Urdu version being available. The Urdu version of Ryff's Scales of Psychological Well-Being (Ryff, 1989), translated by Jibeen and Khalid (2012), was also administered with the permission of the author and the translators. attempted. Ryff's Scales of Psychological Well-Being were administered in the Urdu translation of Jibeen and Khalid (2012), with the permission of the author of the original scales and of the translators.

Procedure

After receiving permission from the administration of the participating hospitals and clinics in Punjab, data collection was carried out. Participants were informed about the objective of the study and were assured that the information obtained would be kept confidential and anonymous, that participation was voluntary, and that they could withdraw at any stage without penalty. Written informed consent was obtained. Rapport was developed with the participants and their queries regarding the research were answered. After submission of the consent form, the demographic information form was administered, followed by the Urdu MFS and the remaining questionnaires. The completed questionnaires were reviewed for any missing responses. Participants were thanked and appreciated for their time.

III. RESULTS

Demographic Characteristics of the Participants

The 60 participants ranged in age from 15 to 45 years, with a mean age of 23.97 years (*SD* = 3.74). Most had studied to undergraduate level (*n* = 43, 71.7%), while 11 (18.3%) were graduates; of the remainder, three (5.0%) had completed intermediate education, two (3.3%) middle school and one (1.7%) matriculation. Half the sample were students (*n* = 30, 50.0%); among the rest, 13 (21.7%) were single and employed, nine (15.0%) were married and employed, five (8.3%) were married and not employed, and three (5.0%) were single and not employed. Forty-two women (70.0%) were married and 18 (30.0%) were single. Fifty-three (88.3%) had no children, five (8.3%) had one child and two (3.3%) had two. Mean monthly family income was PKR 134,283.33 (*SD* = 95,705.95), with 23 women (38.3%) in the middle-income band, 23 (38.3%) in the upper middle band and 14 (23.3%) in the high-income band. In terms of birth order, 22 (36.7%) were firstborn, 15 (25.0%) second born, 13 (21.7%) third born, eight (13.3%) fourth born and two (3.3%) fifth born. Fifty-three participants (88.3%) lived in urban areas and seven (11.7%) in rural areas, and 36 (60.0%) belonged to nuclear families while 24 (40.0%) belonged to joint families. Turning to clinical and anthropometric characteristics, 47 women (78.3%) reported irregular menstrual cycles and 13 (21.7%) reported regular cycles. Mean weight was 63.85 kg (*SD* = 13.97) and mean height was 161.20 cm (*SD* = 6.34).

By body mass index, 28 women (46.7%) fell in the healthy weight range (18.5–24.9), 17 (28.3%) were overweight (25.0–29.9), nine (15.0%) were obese (≥ 30) and six (10.0%) were underweight (< 18.5). Thirty-nine participants (65.0%) were attending private hospitals and 21 (35.0%) government hospitals. The mean duration of illness was

3.86 years (*SD* = 3.32); 35 women (58.3%) had been diagnosed within the preceding three years, 16 (26.7%) between three and six years earlier, six (10.0%) between six and nine years earlier, and three (5.0%) between 12 and 15 years earlier. The mean duration of treatment was 2.05 years (*SD* = 2.06), with 49 women (81.7%) having received treatment for up to three years, seven (11.7%) for three to six years and four (6.7%) for six to nine years.

Table I: Scale Statistics for Scores of Participants on the Urdu MFS (N = 60)

Scale	No. of Items	Minimum	Maximum	M	Variance	SD
Mental Fatigue Scale (Urdu)	14	5	37	18.09	54.39	7.38

Table 1 presents the scale statistics for the Urdu MFS. The mean score of the participants was 18.09 with a standard deviation of 7.38. The lowest possible score on the scale is 0 and the highest possible score is 42; the lowest score obtained in the present sample was 5 and the highest was 37. No participant obtained the minimum or the maximum possible score.

Table II: Item-Total Statistics of the Urdu MFS (N = 60)

Item	Content	Scale mean if item deleted	Scale variance if item deleted	Corrected item-total correlation	Squared multiple correlation	Alpha if item deleted
MFS1	Fatigue in general	16.48	47.15	.612	.539	.836
MFS2	Lack of initiative	16.70	45.60	.719	.693	.829
MFS3	Mental fatigue	16.65	45.85	.695	.670	.831
MFS4	Mental recovery	16.72	49.72	.293	.424	.854
MFS5	Concentration difficulties	16.63	46.79	.602	.576	.836
MFS6	Memory problems	16.80	45.90	.612	.646	.835
MFS7	Slowness of thinking	16.71	45.90	.627	.680	.834
MFS8	Sensitivity to stress	16.80	47.37	.442	.493	.846
MFS9	Tendency to become emotional	16.81	47.88	.462	.383	.844
MFS10	Irritability	16.59	46.51	.531	.586	.840
MFS11	Sensitivity to light	17.18	47.17	.485	.513	.843
MFS12	Sensitivity to noise	16.89	48.49	.444	.465	.845
MFS13	Decreased sleep	17.01	50.80	.207	.269	.859
MFS14	Increased sleep	17.23	48.97	.322	.281	.853

Note. Cronbach's alpha for the full 14-item scale = .852.

Cronbach's alpha is a measure of the internal consistency of the items within a scale and is widely used as an index of test reliability. A higher value indicates a stronger relationship among the items, whereas a lower value indicates a weaker one. Fraenkel and Wallen (1996) stated that reliability can be accepted if the alpha value lies between .70 and .99. The Cronbach's alpha coefficient of the 14-item Urdu MFS was .852, which indicates the reliable status of the scale. Table 2 presents the item-total statistics. Corrected item-total correlations ranged from .207 to .719. Eleven of the fourteen items obtained values of .44 or above, the highest being MFS2 (lack of initiative, .719), MFS3 (mental fatigue, .695) and MFS7 (slowness of thinking, .627).

Two items fell below the criterion of .30, namely MFS4 (mental recovery, .293) and MFS13 (decreased sleep, .207), while MFS14 (increased sleep, .322) was marginal. Cronbach's alpha if item deleted ranged from .829 to .859. The removal of no single item would improve the internal consistency of the scale to any meaningful extent, the largest possible gain being .007 through the deletion of MFS13. All fourteen items were therefore retained so as to preserve the comparability of the Urdu version with the original scale and the applicability of the recommended cut-off score.

Table III: Inter-Item Correlation Matrix of the Urdu MFS (N = 60)

Item	1	2	3	4	5	6	7	8	9	10	11	12	13	14
1	--													
2	.625	--												
3	.558	.642	--											
4	.364	.230	.243	--										
5	.391	.625	.603	.263	--									
6	.529	.593	.485	.233	.484	--								
7	.364	.579	.497	.261	.627	.540	--							
8	.226	.264	.456	−.052	.297	.216	.511	--						
9	.253	.326	.261	.208	.358	.320	.435	.330	--					
10	.358	.492	.418	.014	.326	.129	.312	.422	.276	--				
11	.371	.340	.266	.455	.193	.273	.328	.177	.141	.464	--			
12	.207	.249	.459	.104	.214	.159	.182	.330	.386	.483	.342	--		
13	.195	.182	.061	.052	.015	.368	.037	.042	.150	.157	.202	.136	--	
14	.234	.295	.324	−.001	.225	.367	.105	.220	.137	.237	.180	.168	.055	--

Note. Item numbers correspond to those in Table 2.

Table 3 presents the inter-item correlation matrix. The correlations between the items ranged from −.052 to .642, with a mean inter-item correlation of .298, which lies within the range of .15 to .50 recommended for a measure covering several related symptoms. The highest correlations were obtained between MFS2 and MFS3 (.642), MFS5 and MFS7 (.627), and MFS1 and MFS2 (.625). MFS4 obtained its highest correlation with MFS11 (.455) rather than with the items assessing general and mental fatigue, and MFS13 correlated below .10 with six of the remaining items.

Table IV: Distribution of Participants According to the Recommended Cut-off Score (N = 60)

Categories	Frequency	Percent
At or below cut-off (≤ 10.5)	11	18.3
Above cut-off (> 10.5)	49	81.7
Total	60	100.0

Table 4 presents the distribution of participants against the cut-off score of 10.5 recommended by Johansson and Rönnbäck (2014). Of the 60 participants, 49 (81.7%) obtained scores above the cut-off, indicating the presence of fatigue-related problems, while 11 (18.3%) scored at or below it.

Table V: Correlation of the Urdu MFS with Cognitive Failures and Psychological Well-Being (N = 60)

Variables	*r* with Urdu MFS
Cognitive Failures Questionnaire	.476***
Forgetfulness	.358**
Distractibility	.351**
False triggering	.434***
Psychological Well-Being	−.484***

Note. **p < .01. ***p < .001.

Table 5 shows that scores on the Urdu MFS were positively correlated with the Cognitive Failures Questionnaire and its subscales, and negatively correlated with psychological well-being. The direction and magnitude of these correlations are as expected for a measure of mental fatigue.

IV.DISCUSSION

The aim of this paper was to translate the Mental Fatigue Scale into Urdu and to assess its reliability in Pakistan. The MFS is a self-assessment instrument for mental fatigue and related symptoms, and it was translated here for use with women who have polycystic ovary syndrome. Translation was completed through forward translation by three bilingual experts, reconciliation, back translation and expert review, followed by pre-testing, in line with the procedure described by Acquadro et al. (2008) and consistent with the approach followed in recent Urdu adaptations of the Neurological Fatigue Index (Nazir et al., 2024) and the Modified Polycystic Ovary Syndrome Health-Related Quality of Life Questionnaire (Zaman et al., 2024). The descriptive statistics indicate that the mean score of the 60 participants was 18.09 (*SD* = 7.38) against a possible range of 0 to 42. The scale showed adequate internal consistency, with a Cronbach's alpha of .852. This value is lower than the α = .944 reported for the original version and close to the α = .88 reported in the recent Turkish adaptation (Soylu et al., 2026). It is also lower than the α = .97 reported by Zaman et al. (2024) for the Urdu MPCOSQ, which is unsurprising given that the MFS is shorter and covers a wider range of symptoms than a quality-of-life measure. The alpha obtained falls within the acceptable range described by Fraenkel and Wallen (1996), and the mean inter-item correlation of .298 indicates that it reflects genuine relationships among the items rather than the length of the scale alone.

The item analysis indicates that the items assessing the core features of mental fatigue translated well into Urdu. Lack of initiative, mental fatigue, slowness of thinking, general fatigue, concentration difficulties and memory problems all obtained corrected item-total correlations of .60 or above. The two items assessing sleep obtained the lowest values (MFS13 = .207, MFS14 = .322). These two items assess decreased and increased sleep respectively, which are opposite in direction, and they are therefore not expected to relate closely to one another or to a single total score of fatigue severity. The item assessing mental recovery (MFS4 = .293) also performed below the criterion, and it obtained its highest correlation with the item assessing sensitivity to light rather than with the items assessing general and mental fatigue. It is recommended that the Urdu wording of this item be reviewed in future work. All items were retained in the present study, as the deletion of any single item would have altered the score range of the scale and the applicability of the recommended cut-off without any meaningful gain in internal consistency. Against the recommended cut-off score of 10.5, 81.7% of the participants obtained scores indicating the presence of fatigue-related problems. This is consistent with reports of a high burden of fatigue among women with PCOS (Bajpai et al., 2024) and with the elevated rates of psychological difficulty documented in Pakistani samples (Peerwani et al., 2023; Tariq, 2024). Scores on the Urdu MFS were positively correlated with self-reported cognitive failures and negatively correlated with psychological well-being, in the expected directions and in keeping with the pattern Zahid and Javed (2025) reported in Pakistani women with the condition.

This investigation contributes to work on mental fatigue by making available an Urdu measure of the construct, which clinicians and researchers can use with Urdu-speaking populations rather than relying on an English instrument that many respondents would struggle to read. Several limitations should be borne in mind. The sample of 60 was small, which allowed an examination of internal consistency but not a factor analysis of the translated scale, and test–retest data were not collected, so the temporal stability of the Urdu version remains unknown. Participants were recruited purposively from treatment-seeking women in Punjab and were predominantly urban and educated, so the findings should not be generalised to women with PCOS in rural areas or to those who do not seek treatment. The cut-off score of 10.5 was derived in neurological populations and was applied here without validation against an independent clinical criterion, so the proportion scoring above it describes this sample rather than providing a diagnostic estimate. The correlations with cognitive failures and psychological well-being support the construct validity of the Urdu version, but the Cognitive Failures Questionnaire was itself translated for this study and has not been independently validated in Urdu. Several directions for further work follow from these limitations. The Urdu MFS should next be administered to a larger and more varied sample, drawn from more than one province and including rural and non-treatment-seeking women, so that its factor structure can be examined and compared with the structure reported for the original scale. Administering the scale twice over a short interval would establish its temporal stability, and comparison against a clinical interview or an established fatigue measure would allow the cut-off score to be evaluated and, if

necessary, recalibrated for Pakistani women with PCOS. The Urdu wording of the item on mental recovery should be reviewed with respondents through cognitive interviewing, since its weak relationship with the remaining items may reflect how the item was understood rather than the construct itself. It would also be useful to administer the Urdu MFS in other Urdu-speaking clinical groups, such as patients after stroke or traumatic brain injury, in whom the scale was originally developed, and to test whether scores respond to treatment over time. Independent validation of an Urdu Cognitive Failures Questionnaire would strengthen work of this kind.

Implications

This study fills an existing gap by providing a translated and reliable Urdu version of the Mental Fatigue Scale. The measure is offered to clinical psychologists, gynaecologists and researchers concerned with the assessment of mental fatigue in women with polycystic ovary syndrome and in other Urdu-speaking populations in which mental fatigue is a presenting complaint.

V. CONCLUSION

The original version of the Mental Fatigue Scale was translated into Urdu, the national language of Pakistan. The findings suggest that the Urdu MFS is a reliable measure and that it can be used to assess mental fatigue among Urdu-speaking women with polycystic ovary syndrome.

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