Reliability, Validity and CFA for Mindfulness Self Efficacy Scale-R (MSES-R) in Urdu Language

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ABSTRACT

Aim of the Study: The current study aimed to assess the 22-item MSES-R (Cayoun et,al, 2012) in community sample by adapting it into Urdu Language. The second aim was to establish its psychometric properties by doing test-retest reliability analysis and confirmatory factor analysis.

Method: A sample of men and women (N=186), was taken from Lahore Purposive and convenient sampling was done to collect the data. The study comprised of two phases in total. In phase I, the English version of MSES-R was translated and adapted in Urdu, in the phase II translated version was backwards translated and a pilot study was done. After that, the main study to establish psychometric properties was initiated which included reliability analysis, validity, CFA and test-re test reliability analysis on the data.

Findings: The six-factor MSES-R demonstrated a strong model fit and stability, with a high correlation between scores collected two weeks apart. It contributes to the field of mindfulness research, particularly for clinicians, as it offers an efficient way to measure mindfulness skills. Confirmatory Factor Analysis (CFA) results confirmed the model's goodness of fit, and composite reliability values exceeded 0.7.

Conclusion: In conclusion, the MSES-R was established to be a valuable tool for assessing mindfulness in a population, with good reliability and convergent validity.

Keywords: Mindfulness, Indigenous, Urdu, CFA, Reliability.

Introduction

Mindfulness, a concept deeply rooted in Eastern philosophies, has gained significant recognition and adoption in western psychology and therapeutic practices. At its core, Mindfulness entails nurturing a state of non-judgmental awareness concerning one's current moment experience (Hall-renn, 2007). This awareness encompasses sensations, thoughts, emotions, and external stimuli. Mindfulness is about being fully engaged with the present, without dwelling on the past or worrying about the future (Evans, 2016).

Cayoun, a clinical psychologist and the developer of Mindfulness-integrated Cognitive Behavioral Therapy (MiCBT), has made significant contributions to the understanding and application of

mindfulness in clinical settings (Cayoun et al., 2018). Cayoun's concept of mindfulness emphasizes the importance of integrating mindfulness into cognitive-behavioral therapeutic approaches. In MiCBT, mindfulness is not merely a standalone practice but a fundamental element that permeates the entire therapeutic process. This approach acknowledges the interconnectedness of thoughts, emotions, and behaviors and how mindfulness can facilitate positive change in these domains (Cayoun, 2011). Central to Cayoun's MiCBT concept is the Four-Stage Model, which guides individuals through a systematic process of mindfulness training. The stages involve (1) enhancing awareness of bodily sensations, (2) understanding and regulating emotional responses, (3) developing cognitive insight, and (4) applying mindfulness to daily life challenges. This structured approach helps individuals build resilience and effectively manage various psychological issues like anxiety, depression, and stress (Cayoun, 2011). This work has contributed to the clinical application of mindfulness and sparked interest in the research community. Studies exploring the efficacy of MiCBT have shown promising results in reducing symptoms of various mental health disorders (Cayoun et al, 2018).

This approach offers a comprehensive and structured way to harness the benefits of mindfulness in promoting mental well-being bring attention towards using this integrated approach to be utilized in Pakistani culture, where there is still a lack of properly reliable and valid mindfulness based therapeutic techniques. Mindfulness-based therapies have gained substantial recognition and popularity in recent years for their efficacy in addressing a wide range of psychological and emotional issues (O'Reilly et al., 2014). These therapies are grounded in the practice of mindfulness, which involves cultivating non-judgmental awareness of the present moment. One of the most well-known mindfulness-based therapies is Mindfulness-Based Stress Reduction (MBSR), developed by Jon Kabat-Zinn in thelate 1970s (Wagh-Gumaste, 2022). MBSR combines mindfulness meditation and yoga to reduce stress and enhance overall well-being. Research has shown its effectiveness in reducing symptoms of anxiety, depression, and chronic pain (Carmody & Baer, 2008).

Another prominent approach is Mindfulness-Based Cognitive Therapy (MBCT), developed to prevent the recurrence of depression. MBCT integrates mindfulness practices with principles of cognitive therapy and has been found to be effective in reducing the risk of relapse in individuals with recurrent depression (Lau & McMain, 2005).

The growing interest in mindfulness-based interventions and research has underscored the need for reliable and valid measures to assess mindfulness. Measurement serves several critical purposes in the study and practice of mindfulness. Firstly, it allows researchers to quantify and track the level of mindfulness in individuals, facilitating the evaluation of intervention outcomes and the identification of mindfulness-related factors (Ma et al., 2022).

Secondly, measuring mindfulness is essential for tailoring mindfulness-based interventions to individual needs. Not all individuals start with the same level of mindfulness, and personalized approaches may be more effective (Kropp & Sedlmeier, 2019). Moreover, the need for mindfulness measurement extends to clinical settings, enabling therapists to gauge their clients' progress and adapt interventions accordingly. Thus having a valid and reliable tool to measure mindfulness in Pakistani Urdu speaking population can help in generalizing this approach in a wider manner.

Measuring mindfulness offers various benefits. It provides a baseline assessment, enabling researchers and practitioners to understand an individual's starting point regarding mindfulness skills and potential areas for improvement (Davis & Hayes, 2011). Additionally, it allows for the monitoring of changes over time, helping assess the effectiveness of mindfulness interventions and identifying which components of mindfulness are most influential (Baer et al., 2008).

Furthermore, measurement can serve as a tool for self-awareness and self-regulation. When individuals receive feedback on their mindfulness levels, they may become more motivated to engage in mindfulness practices and observe improvements in their well-being (Brown & Ryan, 2003).

Several scales and questionnaires have been developed to assess mindfulness across various dimensions. One of the most widely used measures is the Five Facet Mindfulness Questionnaire (FFMQ) developed by Baer et al. (2006). The FFMQ assesses mindfulness in terms of five facets: observing, describing, acting with awareness, non-judging of inner experience, and non-reactivity to inner experience. Another commonly used scale is the Mindful Attention Awareness Scale (MAAS) developed by Brown and Ryan (2003). The MAAS evaluates an individual's general tendency to be mindful in daily life by measuring the frequency of attention to present-moment experiences.

Additionally, the Kentucky Inventory of Mindfulness Skills (KIMS) assesses mindfulness in terms of four factors (Baer et al., 2004). These scales, along with others, provide valuable tools for quantifying and exploring mindfulness in research and clinical practice, contributing to the advancement of our understanding of mindfulness and its potential benefits.

The Mindfulness-Based Self-Efficacy Scale Revised (MSES-R) is a valuable tool designed to assess an individual's self-efficacy in practicing mindfulness. Self-efficacy, a concept rooted in Bandura's social cognitive theory (Cayoun et al., 2012), refers to one's belief in their ability to successfully execute tasks or behaviors. In the context of mindfulness, self-efficacy pertains to an individual's confidence in their capability to engage in mindfulness practices effectively.

The MSES-R is a revised version of the original MSES, developed by Cayoun and colleagues (Cayoun et al, 2012). This updated scale takes into account the specific nuances and challenges associated with mindfulness practices and provides a comprehensive assessment of self-efficacy in this domain. The development of the MSES-R emerged from the recognition that mindfulness practices require a unique set of skills and attitudes, and individuals may have varying levels of confidence in their ability to engage in these practices effectively (Frances et al., 2020). The MSES-R was refined to align with the principles and techniques of mindfulness-based interventions, making it a more precise tool for measuring self-efficacy in this context. The primary purpose of the MSES-R is to assess an individual's self-efficacy beliefs related to mindfulness practices. By evaluating one's confidence in their ability to engage in mindfulness exercises, the scale provides valuable insights into an individual's readiness and perceived capability to benefit from mindfulness interventions (Ditrich et al., 2017). This assessment can be particularly useful in clinical and research settings.

Researchers and clinicians utilize the MSES-R to tailor mindfulness interventions to individuals' needs and levels of self-efficacy. For instance, individuals with lower self-efficacy in mindfulness may benefit from more gradual and structured mindfulness training, while those with higher self-efficacy may be ready for more advanced practices (de Jong et al., 2013). Furthermore, tracking changes in self-efficacy over the course of mindfulness interventions can help assess the effectiveness of these programs and identify areas where additional support or modification is required.

The purpose of the current study is to adapt and validate the Mindfulness-Based Self-Efficacy Scale Revised (MSES-R) for the Pakistani population, specifically in the Urdu language. This adaptation seeks to provide a culturally and linguistically appropriate tool to assess self-efficacy in mindfulness practices among individuals in Pakistan. Adapting and validating the MSES-R in Urdu for the Pakistani population holds significant importance for several reasons. Firstly, mindfulness-based interventions have gained recognition as effective approaches to addressing mental health challenges worldwide (Hofmann et al., 2010). As these interventions become more widespread in Pakistan, it is crucial to have a reliable tool to assess individuals' self-efficacy in engaging in mindfulness practices.

Adapting MSES-R to Urdu addresses cultural nuances, enhancing its validity. It facilitates cross-cultural research by aligning self-efficacy measures with Pakistan's cultural context. This ensures a precise exploration of mindfulness's interplay with cultural values, contributing to a comprehensive understanding of mindfulness in diverse populations (Botha & Lesch, 2019) Adapting and validating the Urdu version of MSES-R offers significant benefits in Pakistan. It supports research on mindfulness

interventions' effectiveness and enables clinicians to assess clients' readiness for culturally tailored mindfulness practices, enhancing mental health care in the country (Sangraula et al., 2020).

Method

Research Design

The current study was done in two Phases. Phase-I was done for translation and adaption of the MSES-R into Urdu language. After that Phase-II was initiated to test the psychometric properties of MSES-R. An informed consent and debriefing form was provided to the willing participants at the imitation of data collection. At first the demographic information questionnaire administered which asked for general and specific questions related to the participant and their previous psychological history e.g. age, gender, education etc according to the literature.

Instrument

Mindfulness-Based Self-Efficacy Scale Revised (MSES-R), (2012) was used. It was used in order to obtain information about mindfulness used in daily basis for participants, MSES-R (Cayoun et al, 2012) was used. It has 22 items with 5 point Likert type scale (0=Completely; 1= A lot; 2= Moderately; 3= A little, and 4= Not at all). It has 6 factors and its subscales include Emotion Regulation, Distress Tolerance, Equanimity, Taking Responsibility, Social Skills, and Interpersonal Effectiveness. The test-retest reliability of MSES-R is r= .88, and internal consistency is α= ,86. It has good discriminant and convergent validity. Overall it's a reliable and valid measure for mindfulness efficacy in an individual.

Phase-I: Translation and Adaptation. The forward translation process placed a significant emphasis on maintaining the scale's conceptual integrity and ensuring cross-cultural equivalence in terms of understanding. The primary objective of the translation effort was to convey the meaning of the diagnostic symptoms rather than adhering strictly to a literal translation. The method of translation, which was followed was given by Water"s et al. (2006). Following steps were followed in the translation of this scale

Step 1: Forward translation. The initial phase of the scale translation process involved a forward translation, where the scale was translated from English to Urdu. Three experts were chosen for this task, all of whom were well-versed in both English and Urdu, and had extensive experience in psychological research. The team of translators included a Ph.D. holder in psychology, a Ph.D. scholar specializing in psychology, and a lecturer proficient in English.

Step 2: Finalization of items for the translated scale. In this step, experts of the field selected the final items that were included from the translated pool of items. All items were compared with their parent English items from the original scale so their meaning was kept intact. Experts who led this phase included PhD in psychology and English.

Step 3: Backwards translation of the translated items. The chosen items were once more translated into English. This measure was taken to verify that the essence and intended meaning of the original item pool remained intact. Subsequently, six statements were adjusted and refined to align with the original scale's intended meaning. These items were subsequently evaluated by psychology experts, all of whom held Ph.D. degrees in psychology and possessed significant research expertise in the field.

Phase-II. Validation Study. Following the pilot study involving five participants, the Urdu-translated edition of the MSES-R was employed to conduct a reliability analysis, with the intention of subsequently applying Confirmatory Factor Analysis (CFA) to the translated version.

Sample

A purposive sample of 186 participants was taken from public hospitals. The sample included the participants who would have come as a caregiver in hospital with a patient. The mean age of the participants was (M=29.36, SD = 4.65).

Procedure

The study's participants were reached out to within the psychiatric wards of government hospitals while they were present there as caregivers of patients. Prior to commencing data collection, necessary permissions were obtained from the Medical Superintendents and departmental heads. A concise overview of the study's objectives was provided to the participants; after which they were given the questionnaire to complete. This questionnaire included a demographic section, which had been crafted by taking previous literature into account. Each participant typically spent approximately 5-10 minutes to fill out the questionnaire. Following the data collection, participants were graciously thanked, and their contact information was also gathered for the possibility of their involvement in future studies on the same topic.

Table 1: *Baseline characteristics of the sample (N=186).*

Variables		Mean	St. Deviation
Age in years		29.36	4.65
		Frequencies (f)	**Percentages (%)**
Gender			
	Male	108	58.06
	Female	78	41.93
Education			
	No formal education	45	24.19
	Middle to Intermediate	44	23.65
	Graduation	63	33.87
	Master	34	18.27
Family system			
	Nuclear	102	54.83
	Joint	84	45.16
Marital Status			
	Single	52	27.9
	Married	113	60.7
	Divorced / Widowed	21	1.12
Previous history of any psychological disorder			
	Yes	34	18.2
	No	152	81.7

Results

Amos (24.0) was used for the analysis of model in this study. The results of the Confirmatory Factor Analysis (CFA) demonstrated that the fit of the four-factor model for MEB scores was deemed acceptable. The fit indices were as follows: $\chi2/df = 2.56$ ($\chi2$ value of 611.7 with 239 degrees of freedom), RMSEA = 0.066 (with a 90% confidence interval of 0.060 to 0.073), SRMR = 0.075, CFI = 0.934, and TLI = 0.924. Additionally, the standardized factor loadings, as presented in Table 2, were all found to be satisfactory. The model also exhibited adequate convergent validity, with an Average Variance Extracted (AVE) of 0.74.

Table 2 shows Standardized Estimates of Factor Loadings from the Confirmatory Factor Analysis (CFA) in the total sample Item and the Figure 1 states the CFA of item pool of the translated version of MSES-R.
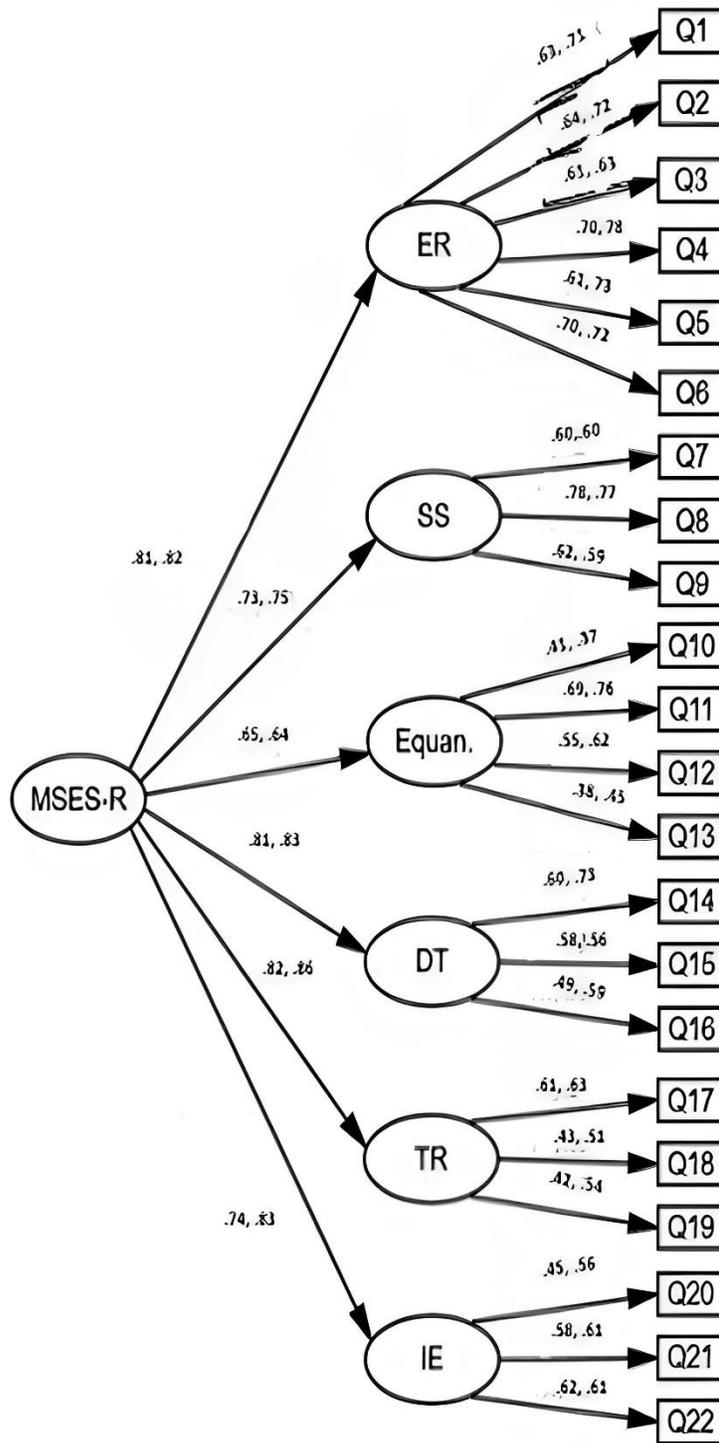
Table 2. *Goodness-of-Fit Indices for Tested Models (N=186)*

Model	χ²	Df	P	χ²/df	GFI	CFI	RMSEA
M1 26 items	96.432	32	<.001	2.645	.923	.910	.071

Note: p<0.1* χ² /df: relative chi-square. GFI, Goodness of fit index; CFI, Comparative fit index; RMSEA, root mean square error of approximation. Acceptable values of fit: normed χ2/df < 5 (Wheaton, 1977); RMSEA < .100 (Joreskog & Sorbom, 2006); GFI > .90 (Cole, 1987); CFI > .90 (Hu & Bentler, 1999).

Chi square is an ideal to test the significance of model. Chi square also has high sensitivity for the sample size in a study. Ratio of chi-square to the degree of freedom (χ2/df) with statistical value was found to be 2.645 which is less than 3. The goodness of fit Index (GFI) depicted a value of .923. Tabachnick and Fidell (2007) reported that GFI is the value that is instead used in contrast to chi square to compute the proportional variance accounted for by the population covariance. The statistics of comparative fit index (CFI) was .889, with the assumption that all the latent variables had no correlation among each other. It was also assumed that the comparison of latent variable with sample covariance matrices with this nullified model. The root mean square error of approximation (RMSEA) of the study was found to be .071. Table 2 showed medium validity of this model and deems it as an acceptable fit.

Internal consistency reliability of the MSES, was obtained through Cronbach's Alpha (Table 3). This table showed high reliability coefficient i.e. MSES (α =.746).

Table 3. *Descriptive Statistics and Cronbach's Alpha Values (N=186)*

Factors	Mean (SD)	A
MSES- overall	21.41 (4.49)	.746
Emotion regulation	22.42 (4.41)	.81
Social Skills	20.12 (4.14)	.723
Equanimity	22.13 (4.67)	.76
Distress Tolerance	24.86 (4.92)	.74
Taking Responsibility	23.17 (4.81)	.73
Interpersonal Effectiveness	23.54 (4.75)	.77

Note. SD = standard deviation.

Reliability along with convergent and discriminant validity were also calculated through AMOS in which factors of MSES-R were illustrated through the composite reliability (CR) and maximum reliability (MaxR or H) (Hancock & Mueller, 2001).

Table 4: *Reliability and convergent and discriminant validity (N=186)*

	CR	AVE	MaxR(h)	p-value
MSES-R (total)				
	.75	.61	.81	.000

Table 4 shows a CR value >0.7 (CR=0.75) and an H value >0.8 (MaxR=0.81). As regards to the convergent validity (Table 4), CR>AVE, and the AVE value was greater than 0.5 (AVE=0.61). Thus, it is promising to state that this one-dimensional questionnaire has decent reliability and convergent validity.

The test-retest reliability coefficient of the scale was assessed using the test-retest method. The findings revealed a robust positive correlation between the initial test scores (with a mean of 53.62 and a standard deviation of 14.01) and the retest scores (with a mean of 52.17 and a standard deviation of 14.80). The correlation coefficient was 0.78, with a sample size of 30, and the relationship was statistically significant at p < 0.01. Approximately 76% of the variance was shared between the two sets of scores.

Discussion

The study focused on examining the factor structure, measurement consistency, and reliability of the 22-item MSES-R within community samples. Drawing from self-efficacy theory (Bandura, 1997), it's widely recognized that an individual's perceived self-efficacy and outcome expectancies are crucial determinants of their behavior. Given the established role of self-efficacy beliefs in influencing successful outcomes (Bandura, 2006), we contend that assessing mindfulness-related self-efficacy holds value in the field. Particularly in clinical contexts, it has been suggested by other scholars that "Clinicians implementing mindfulness-based interventions should consider the role of coping self-efficacy in the relationship between mindfulness and emotion regulation" (Luberto et al., 2013, p. 274).

In line with the theoretical underpinnings and qualitative framework provided by Cayoun (2011), and findings from Kasselis (2011) and Atalay et al. (2017), the six-factor MSES-R exhibited a satisfactory model fit across all the examined samples. Furthermore, the results indicate that the MSES-R remains relatively stable over a short period, as demonstrated by the strong correlation between scores collected two weeks apart and a shared variance of 76%.

Considering the present findings and the insights from prior studies, the MSES-R has been established as a valuable contribution to the field of mindfulness research, offering an additional dimension for understanding behavior change facilitated by mindfulness training.

Previously, there was no Urdu version available for the MSES-R, making this development especially valuable for clinicians. It offers a quick and robust means of measuring mindfulness, providing clinicians with an efficient option for official scoring and skill assessment.

The χ^2/df ratio, which was computed at 2.645, falls below the threshold of 3, indicating a favorable model fit (Özdemir & Eyduran, 2005). This observation highlights that our translated version   produces reliability outcomes consistent with established mindfulness measures, such as the one developed by Shear, Brown, Barlow, Money, Sholomskas, Woods, and Papp in 1997, which reported Pearson correlation values ranging from 0.69 to 0.71 (Houck, Spiegel, Shear, & Rucci, 2002).

Confirmatory Factor Analysis (CFA) is employed to evaluate the model's goodness of fit concerning the factors associated with the scale. The GFI (Goodness of Fit Index) in the present study registered a statistical value of 0.923. As previously defined by Tabachnick and Fidell (2007), GFI is utilized alongside the chi-square to estimate the proportion of variance accounted for by the population covariance, which was also applied in our model. The Comparative Fit Index (CFI) yielded a value of 0.910, signifying that all latent variables did not correlate with each other. When compared to the sample covariance matrices, this index was tested against the null model, as presented in the current study. The Root Mean Square Error of Approximation (RMSEA), at 0.071, indicates moderate validity for the model, rendering it an acceptable fit for the 9-item model. In sum, these results indicate a good model fit and satisfactory internal reliability for the scale.

The composite reliability of the factors was notably high, with a value of 0.75 (Fornell & Larcker, 1981). Reliability was also assessed by computing the composite reliability (CR) and maximum reliability (MaxR or H) (Hancock & Mueller, 2001). To establish convergent validity, the average variance extracted (AVE) was calculated and compared to the value of CR. Discriminant validity was assessed through the computation of the maximum shared squared variance (MSV) and the average shared squared variance (ASV), followed by a comparison with AVE. This study adopted the cutoff criteria set by Hu and Bentler (1999), which, in accordance with Fornell and Larcker (1981), are considered suitable indicators of convergent validity (Maroco et al, 2014).

In Table 4, the CR value exceeds 0.7 (CR=0.79), and the MaxR(h) value surpasses 0.8 (MaxR=0.83). Regarding convergent validity (Table 4), CR is greater than AVE, and the AVE value itself is found to be above 0.5 (AVE=0.52). These findings confirm that this questionnaire not only exhibits strong reliability

but also demonstrates robust convergent validity, making it suitable for use with a population to determine skills of mindfulness.

The MSES-R demonstrated satisfactory fit across all the examined samples, although factors with fewer items showed lower reliability. Notably, the MSES-R exhibited scalar measurement invariance when comparing the clinical and community samples from Pakistan.

Conclusion

In conclusion, these findings contribute further support to the idea that the MSES-R is a valuable addition to the array of assessment tools for investigating the effectiveness and outcomes of mindfulness-based programs, particularly in clinical contexts in Urdu language.

Limitations and Suggestions

A limitation of the study lies in its constrained sample, focused solely on urban areas within Lahore. This narrow scope restricts the instrument's applicability on a broader scale and overlooks the diverse cultural characteristics across various provinces in Pakistan. Additionally, although the current study pertains to a general population, it is advisable that future research explores a clinical group for a more comprehensive understanding.

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