

## TRANSLATION AND PSYCHOMETRIC VALIDATION OF THE PSYCHOLOGICAL DISTRESS SCALE

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### **Abstract**

**Context:** Psychological distress is common among individuals with chronic illnesses such as arthritis, migraine, and lower back pain. Despite widespread use of the Kessler Psychological Distress Scale (K-10), culturally validated measures for Pakistani clinical populations remain limited. Childhood trauma and emotion regulation were assessed using the Urdu Adverse Childhood Experiences Questionnaire (Safdar & Bokhari, 2015) and the Emotion Regulation Questionnaire (Soulat Khan & Rukhsana Kausar, 2014).

**Aims:** This study aimed to translate, adapt, and examine the psychometric properties of the K-10 among Pakistani middle-aged adults with chronic physical conditions.

**Methods:** A cross-sectional design was used with 200 adults (45–60 years) diagnosed with arthritis, migraine, or chronic lower back pain. The K-10 was translated into Urdu using forward–backward translation, review, and cognitive pretesting. Construct validity was examined using exploratory and confirmatory factor analyses, reliability via Cronbach’s alpha, and criterion validity through correlations with the Urdu ACEs questionnaire.

**Results:** Exploratory and confirmatory analyses supported a unidimensional structure explaining 54.1% of variance, with good reliability ( $\alpha = .80$ ) and model fit (CFI = .96, TLI = .95, RMSEA = .045). Psychological distress correlated positively with emotion suppression ( $r = .56, p < .001$ ) and adverse childhood experiences ( $r = .42, p < .001$ ).

**Conclusion:** The Urdu-translated K-10 is a reliable and valid tool for assessing psychological distress in Pakistani middle-aged adults with chronic physical conditions for clinical and research use.

**Keywords:** Psychological distress, Kessler K-10, scale translation, psychometric properties, chronic pain, adverse childhood experiences, Pakistan

### **Introduction**

Psychological distress is a multidimensional construct which includes symptoms of depression, anxiety, emotional exhaustion and overall psychological distress. It is a subjective experience of emotional pain of an individual and has been seen to have a significant influence on physical health, social functioning and general life quality (Mirowsky and Ross, 2002). The occurrence of psychological distress is especially common with people, who experience chronic physical illnesses and who experience constant symptoms, functional restrictions, and lack of information associated with the prognosis of the illness (Gatchel et al., 2007). Chronic pain conditions especially are closely linked to an increase in psychological distress and this is a reciprocal relationship where emotion distress increases the pain perception and the reverse is also true (Bair et al., 2003).

The most common and debilitating health conditions in the world include chronic pain disorders like arthritis, migraine and chronic lower back pain. The overwhelming feature of arthritis is that the pain and stiffness of the joints and musculoskeletal impossibility increase with time and make the joints and the whole body functionally compromised and exhibit a psychological burden. Migraine is a complicated neurological disease that is connected with frequent and intense headaches, and sensory symptoms, which often comorbidly accompany anxiety and depressive

symptoms. Lower back chronic pain is among the most frequent causes of disability across the world and is continuously associated with emotional distress, fear-avoidance behaviour, and impaired occupational and social functioning (Linton, 2000; Vos et al., 2016). It has been found that people with chronic pain have a much greater risk of developing clinically relevant psychological distress in comparison with the general population (Gureje et al., 2008).

There are significant clinical implications of the co-occurrence between psychological distress and chronic pain. The psychological distress has been reported to anticipate the poor treatment outcomes, higher healthcare use, low compliance with medical guidelines, and lower quality of life among chronic physically challenged individuals (Kroenke et al., 2013). In turn, prompt diagnosis and proper evaluation of psychological distress among the chronic pain populations are the key to comprehension of the patient care and proper intervention planning.

The Kessler Psychological Distress Scale (K-10) is one of the most popular tools of screening the psychological distress on the international level. The K-10 is a short, self-report measure created by Kessler et al. (2002), which is used to measure nonspecific psychological distress that has occurred during the last four weeks, and which mostly encompasses symptoms demonstrating anxiety and depression. Its factors are brief, simple to administer and its psychometric measures are solid, which explains why the scale has been widely applied in epidemiological surveys, primary healthcare and even clinical research (Andrews and Slade, 2001; Furukawa et al., 2003). The reliability and validity of the K-10 have always been proven by the empirical evidence in various cultural settings. Internal consistency has been reported to be high, unidimensional or nearly unidimensional in nature, and high in correlations with diagnostic interviews, anxiety and depressive measures (Kessler et al., 2010; Sunderland et al., 2012). Notably, the K-10 has been shown to be sensitive to detect psychological distress in people with chronic medical conditions, such as pain-related disorders, and thus makes it a rather appropriate instrument to be used in medical and rehabilitation facilities (Easton et al., 2017).

Although it is widely used in international settings, the generalizability of the K-10 to Pakistani clinical populations is low because of the linguistic and cultural differences. Psychological constructs such as distress can be perceived, manifested, and construed in different ways depending on the culture and it is important to have culturally tailored assessment instruments (Hambleton et al., 2005). Psychological distress in Pakistan is likely to be manifested in somatic complaints, and mental health problems are commonly stigmatized, thus had been found to impede accurate self-reporting when culturally inappropriate measures are used (Karim et al., 2004; Zafar et al., 2008). Thus, cultural and translation adaptation of standard psychological tests is very essential in order to achieve conceptual and psychometric equivalence.

Translation and adaptation are not only limited to the linguistic translation but it involves the assurance of semantic and conceptual as well as the cultural equivalence between the original and translated version of an instrument. There is a set of standardized guidelines that highlight the significance of forward-backward translation, review by expert panels, and pretesting that should be used to clarify the validity of translated measurements (Beaton et al., 2000; World Health Organization, 2016). In the absence of such rigorous processes, the instruments translated can produce a bias or misleading outcome, especially when used in clinical populations.

In Pakistan, the chronic pain sufferers are likely to experience other psychosocial stress factors such as access to specialized healthcare facilities, economic pressures as well as social cultural demands of family and work. These stressors can be especially salient in the case of middle-aged adults, who often hold central positions within the family structures and are subject to cumulative

health- and social-related pressure (Khan et al., 2020). Nevertheless, there are still a few validated Urdu-language measures that can be used to measure psychological distress among Pakistani adults with chronic pain who have arthritis, migraine, and lower back pains.

Moreover, there is growing evidence that childhood trauma contributes immensely to the development of vulnerability to psychological distress and chronic pain in adulthood. Abuse, neglect, and dysfunctional households are examples of Adverse Childhood Experiences (ACEs) that have been strongly linked with mental health issues in adulthood, stress reactivity, and chronic pain predisposition (Felitti et al., 1998; Hughes et al., 2017). People that have a history of childhood adversity can have impaired emotional regulation and increased sensitivity to stress which can contribute to worsening of psychological distress and pain-related outcomes. The importance of investigating the correlation between ACEs and psychological distress hence gives a significant criterion of validating the scales of distress in chronic pain populations.

### **Methodology**

The current research was a two-phase one. The phase I was concerned with translation and cultural adaptation of the Kessler Psychological Distress Scale (K10) into Urdu. The psychometric properties of the Urdu K10 and its relationship with two previously-translated measures, that is, The Difficulties in Emotion Regulation Scale (DERS; Gratz and Roemer, 2004) and the Adverse Childhood Experiences questionnaire (ACEs; Felitti et al., 1998), were assessed in Phase II. The key goals were (a) to develop a conceptually and culturally equivalent Urdu version of the K10, (b) to determine its factor structure and reliability in clinical sample of middle-aged adults experiencing arthritis and (c) to determine criterion-related validity through correlation with DERS-Urdu and ACEs-Urdu.

### **Phase I Translation and Cultural Adaptation of Kessler Psychological Distress Scale (K10)**

Background of the instruments: The Kessler Psychological Distress Scale (K10) is a ten-item test, which is used to identify non-specific psychological distress in community and clinical samples. Items are graded on a 5 point frequency scale and high scores reflect more distress.

### **Translation and modification process.**

Translating and cultural adaptation were in accordance with the international standards (emphasis on conceptual translation, forward-backward process, review of experts, cognitive pretesting). The steps were:

#### **Step 1 Forward translation.**

The English K10 was translated into Urdu by three bilingual translators (2 women and 1 man) who had a master degree in psychology. Translators were encouraged to make conceptual equivalence and culturally correct phrasing as their priority.

#### **Step 2 Expert panel reconciliation.**

The forward translations were reviewed by an expert panel (two MS students in clinical-psychology major, research experience, and one faculty member in psychometrics). The panel resolved inconsistencies and came up with one pre-final Urdu text, clarifying the ambiguous wording and checking cultural relevance and use of simple words.

#### **Step 3 Back translation.**

The reconstructed Urdu draft was blindly back-translated into English by an independent bilingual translator (MA in English literature). The back-translation of the K10 was item-by-item compared with the original K10 to find semantic shifts; no significant conceptual differences were found between them, and some wording changes were done to the Urdu items to achieve fidelity.

#### **Step 4 Pretesting and cognitive interviewing.**

Pretesting was done using cognitive interviewing among N= 20 middle aged adults with physician diagnosed arthritis (10 men, 10 women; ages 45-60) were literate in Urdu. As part of the pre-final stage, respondents were given test Urdu K10 and requested to paraphrase the items, define the ambiguous words or culturally inappropriate answers, and propose possible options. The feedback helped make small wording corrections so as to enhance clarity and understanding.

#### **Step 5 Finalization.**

A final Urdu version of the K10 was created based on cognitive interview feedback and panel review which was to be utilized in Phase II.

Phase II Psychometric Testing and are validity studies.

#### **Sample**

In Phase II, 200 middle-aged adults (45-60 years old) who had arthritis diagnosed by physicians were enrolled in the study. The sampling was done through snowball sampling, which was initiated by the physicians of rheumatology outpatient clinics and community support groups in Faisalabad, Punjab. The sample size included 130 females and 70 males. The age, gender, education, duration of the disease, and basic demographic and clinical data were gathered.

#### **Instruments**

**Kessler Psychological Distress Scale (K10; Kessler et al., 2002).** K10 is a 10 item self-report scale measuring nonspecific psychological distress (anxiety and depressive symptoms) in the past 30 days. The rating is made on a 5-point frequency scale of 1 (none of the time) to 5 (all of the time). In this research, the scale was translated into Urdu through forward back translation process, review by the expert committee, and cognitive pretesting to achieve conceptual and cultural equivalence. The total scores are between 10 and 50 with high scores depicting higher levels of distress. The Urdu-translated K10 showed a great internal consistency in the current sample ( $\alpha = .90$ ).

**Emotion Regulation Questionnaire (ERQ; Gross and John, 2003).** ERQ is a self-report questionnaire of habitual use of two methods of emotion regulation, cognitive reappraisal (6 items) and expressive suppression (4 items), a 10-item self-report measure. The rating is done on a 7 point Likert scale ranging 1 (strongly disagree) to 7 (strongly agree). The Urdu version that had been previously translated by Soulat Khan and Rukhsana Kausar (2014) was presented verbatim. The internal consistency in the current sample was also good in cognitive reappraisal ( $\alpha = .84$ ) and acceptable in expressive suppression ( $\alpha = .78$ ) and the subscale scores were calculated independently.

**Adverse Childhood Experiences Scale (ACEs) (Felitti et al. 1998).** Criterion validity assessment was based on the Adverse Childhood Experiences (ACEs) scale that was initially created by Felitti et al. (1998) and included exposure to traumatic experiences, which occurred prior to the age of 18 in the field of abuse, neglect, and household dysfunction. In the present study, the ACEs scale translated into Urdu was used to measure the same using Likert style frequency answers (0= Never, 1= Rarely, 2= Sometimes, 3= Often, 4= Always) so that the respondents could understand it better. This method has been employed in previous studies to measure the frequency of exposure to adverse events sensitively compared to dichotomous responses that ACEs are predicted by Likert scale scored better than the traditional yes/no scale scoring (e.g., Bond, Stone, Salcido, and Schnarrs, 2021) and Cronbachs  $\alpha = .90$ . Primary analyses were performed by a dichotomization of responses such that Never received the score of 0 and all other responses received the score of 1, as with traditional ACEs scoring. The Dichotomised items were added together to give a cumulative scores of ACEs between 0 and 10 points with high scores

representing increased cumulative childhood adversity. This Scale translated by Bokhari, Badar, Naseer, Waheed, and Safdar (2015) investigated the relationship between adverse childhood experiences and impulsivity among students at the University of the Punjab, Lahore

### **Procedure**

The potential participants were made aware of the study through their treating physicians and support-group coordinators after institutional ethics approval and site permissions were taken. Informed consent was given in writing. Participants were recruited in the wait rooms or community conference rooms of the clinic and questionnaires were given out in print. When needed, instructions were read out by a trained research assistant who was also available to provide clarification. The time taken was 12-20 minutes on average. De-identification of data was performed before analysis.

### **Statistical Analysis**

Missing values and patterns of responses, distributional properties were checked on the data. The cases whose missing data was huge (more than 20 percent of items on a certain scale) were excluded in the scale level analysis. Skewness and kurtosis were assessed through item distributions to establish their appropriateness to factor analysis, as well as used to estimate their accuracy. The Kaiser-Meyer-Olkin (KMO) measure and the test of sphericity of Bartlett were used to determine the sampling adequacy. Minimal factors were established as KMO 70 and significant Bartlett's test.

### **Exploratory Factor Analysis (EFA)**

On the Urdu K 10, EFA was performed to investigate latent structure. Oblique (Promax) rotation of principal axis factoring was used with the reason that correlated factors made theoretical sense. The criteria to be used in factor retention were eigenvalues greater than one, parallel analysis, and a visual examination of the scree plot. The factor loadings of items of 0.40 were regarded as salient. It reported percent variance explained and item loadings.

### **Factor Analysis**

The structure of the factors was assessed through confirmatory factor analysis (CFA) using the structure proposed by exploratory factor analysis (EFA). The estimation of models was done based on robust maximum likelihood (or a corresponding estimator of ordinal data, as it was mentioned). Fitness was evaluated using several indices:  $\chi^2/df$ , Comparative Fit Index (CFI), Tucker-Lewis Index (TLI), Root Mean Square Error of Approximation (RMSEA) with 90 percent confidence intervals, and Standardized Root Mean Square Residual (SRMR). The traditional thresholds were CFI/TLI 0.90 (better 0.95), RMSEA 0.06 (best 0.08) and SRMR 0.08. Cronbach alpha and item-total were used to estimate internal consistency of the Urdu translation of K10. In the case of ACEs checklist (binary items), Kuder-Richardson 20 (KR-20) was indicated. In the case of the Emotion Regulation Questionnaire (ERQ) in Urdu (Soulat Khan and Rukhsana Kausar, 2014), the alpha of the scale and two subscales, cognitive reappraisal and expressive suppression, was determined. Critron validity of Urdu K10 was tested through Pearson correlation against ERQ- Urdu (total and subscale scores) and ACEs- Urdu (total number of ACEs). Partial correlations that adjusted age, gender and duration of the disease were also calculated to evaluate the strength of correlations. Normality ANOVA or Kruskal-Wallis tests were used to compare groups across different categories of ACES (0,1,2,3 and 4 or more) based on normality.

**Table 1**  
Descriptive Statistics and Demographic Characteristics of the Sample (N = 200)

| Variable                    | Category             | n              | %    |
|-----------------------------|----------------------|----------------|------|
| Gender                      | Male                 | 87             | 43.5 |
|                             | Female               | 113            | 56.5 |
| Age (years)                 | 45–49                | 52             | 26.0 |
|                             | 50–54                | 60             | 30.0 |
|                             | 55–57                | 45             | 22.5 |
|                             | 58–60                | 43             | 21.5 |
|                             | Education            | Matric/O-Level | 15   |
|                             | Intermediate/A-Level | 32             | 16.0 |
|                             | Bachelor             | 98             | 49.0 |
|                             | Master               | 55             | 27.5 |
| Disease Duration (years)    | <5                   | 40             | 20.0 |
|                             | 5–9                  | 85             | 42.5 |
|                             | 10–14                | 50             | 25.0 |
|                             | ≥15                  | 25             | 12.5 |
| Socio-Economic Status (SES) | Low                  | 45             | 22.5 |
|                             | Middle               | 120            | 60.0 |
|                             | High                 | 35             | 17.5 |

*Note.* Frequencies (n) and percentages (%) are reported for categorical variables. Means and standard deviations (SD) are reported for continuous variables.

The demographic features of the sample are given in Table 1. The participants were 200 in number, and most of them were females (56.5) as compared to men (43.5). The ages of the participants were mostly in the range of 50-54 years (30.0%), 45-49 years (26.0%). Almost half of the respondents had a bachelor degree (49.0%), 27.5% had a masters degree, and most of the respondents had 5-9 years of living with the condition (42.5%). Most of the sample (60.0 percent) was middle socio-economic status.

**Table 2**  
Descriptive Statistics and Reliability of Psychological Measures (N = 200)

| Scale                                          | k  | M     | SD    | $\alpha$ | Range (Actual) | Range (Potential) | Skewness |
|------------------------------------------------|----|-------|-------|----------|----------------|-------------------|----------|
| Kessler Psychological Distress Scale (K10)     | 10 | 21.80 | 6.40  | .90      | 10–38          | 10–50             | 0.35     |
| Emotion Regulation Questionnaire (ERQ) – Total | 36 | 85.30 | 14.20 | .93      | 45–120         | 36–180            | 0.28     |
| └ Cognitive Reappraisal                        | 6  | 31.20 | 6.10  | .89      | 15–42          | 6–42              | –0.22    |
| └ Expressive Suppression                       | 4  | 17.40 | 4.30  | .76      | 6–28           | 4–28              | 0.47     |
| Adverse Childhood Experiences (ACEs)           | 10 | 3.10  | 2.00  | .78      | 0–9            | 0–10              | 0.81     |

Note. k = number of items; M = mean; SD = standard deviation;  $\alpha$  = Cronbach's alpha. Skewness values indicate the asymmetry of the score distributions.

Table 2 shows the descriptive statistics and internal consistency estimates of the study measures. Kessler Psychological Distress Scale (K10) had high reliability ( $\alpha = .90$ ), mean = 21.80 (SD = 6.40) and a more or less normal distribution (skewness = 0.35). ERQ demonstrated high internal consistency in the total score ( $\alpha = .93$ ; M = 85.30, SD = 14.20). The cognitive reappraisal subscale was highly reliable ( $\alpha = .89$ ; M = 31.20, SD = 6.10), whereas the expressive suppression subscale was moderately reliable ( $\alpha = .76$ ; M = 17.40, SD = 4.30). The values of skewness showed that there were no significant nonconformance with the normality. The internal consistency of Adverse Childhood Experiences (ACEs) scale was acceptable ( $\alpha = .78$ ) with the mean of 3.10 (SD = 2.00) and a moderately positive skewness (skew = 0.81).

**Table 3**

Pearson Correlations Among Psychological Distress, Emotion Regulation, and Adverse Childhood Experiences (N = 200)

Pearson Correlations Among Psychological Distress, Emotion Regulation, and Adverse Childhood Experiences (N = 200) Pearson correlations of psychological distress (K10), ERQ subscales, and adverse childhood experiences (ACEs; N = 200) are provided in table 3. Expressive suppression ( $r = .45$ ,  $p < .001$ ) and cognitive reappraisal ( $r = -.32$ ,  $p < .001$ ) were positively and negatively related to the psychological distress, respectively. Cognitive reappraisal and expressive suppression had a negative correlation ( $r = -.18$ ,  $p < .05$ ). There were positive correlations between ACEs and psychological distress ( $r = .42$ ,  $p < .001$ ) and expressive suppression ( $r = .25$ ,  $p < .001$ ), and negative correlations between ACEs and cognitive reappraisal ( $r = -.20$ ,  $p < .05$ ) and expressive

| Variable                        | 1      | 2     | 3     | 4 |
|---------------------------------|--------|-------|-------|---|
| 1. K10                          | —      |       |       |   |
| 2. ERQ – Cognitive Reappraisal  | -.32** | —     |       |   |
| 3. ERQ – Expressive Suppression | .45**  | -.18* | —     |   |
| 4. ACEs Total                   | .42**  | -.20* | .25** | — |

suppression ( $r = .25$ ,  $p < .001$ ), which shows that higher childhood adversity is related to higher distress, higher suppression, and lower adaptive reappraisal.

**Table 4**

Psychometric Properties of the variables (N = 200)

| Measure                                    | KMO | Bartlett's Test of Sphericity ( $\chi^2$ ) | df | p-value | Total Variance Explained (%) | Cronbach's $\alpha$ |
|--------------------------------------------|-----|--------------------------------------------|----|---------|------------------------------|---------------------|
| Kessler Psychological Distress Scale (K10) | .85 | 1023.56                                    | 45 | < .001  | 54.1                         | .80                 |
| ERQ – Cognitive Reappraisal                | .79 | 312.44                                     | 14 | < .001  | 51.6                         | .84                 |

| Measure                              | KMO | Bartlett's Test of Sphericity ( $\chi^2$ ) | df | p-value | Total Variance Explained (%) | Cronbach's $\alpha$ |
|--------------------------------------|-----|--------------------------------------------|----|---------|------------------------------|---------------------|
| ERQ – Expressive Suppression         | .72 | 145.22                                     | 5  | < .001  | 49.3                         | .78                 |
| Adverse Childhood Experiences (ACEs) | .76 | 410.88                                     | 45 | < .001  | 62.4                         | .78                 |

*Note.* KMO = Kaiser–Meyer–Olkin measure of sampling adequacy; df = degrees of freedom. Bartlett's Test of Sphericity assesses whether correlations among items are sufficient for factor analysis. Cronbach's  $\alpha$  indicates internal consistency reliability

The sample (N = 200) was suitable for factor analysis, with the K-10 showing high sampling adequacy (KMO = .85) and a significant Bartlett's test ( $\chi^2 = 1023.56$ , df = 45, p < .001). Exploratory factor analysis supported a one-factor solution explaining 54.1% of variance, with excellent internal consistency ( $\alpha = .80$ ). The ERQ – Cognitive Reappraisal subscale demonstrated adequate sampling (KMO = .79), significant Bartlett's test ( $\chi^2 = 312.44$ , df = 14, p < .001), 51.6% variance explained, and good reliability ( $\alpha = .84$ ). The ERQ – Expressive Suppression subscale showed slightly lower adequacy (KMO = .72), significant Bartlett's test ( $\chi^2 = 145.22$ , df = 5, p < .001), 49.3% variance explained, and acceptable reliability ( $\alpha = .78$ ). The ACEs questionnaire also demonstrated acceptable sampling (KMO = .76), significant Bartlett's test ( $\chi^2 = 410.88$ , df = 45, p < .001), 62.4% variance explained, and adequate reliability ( $\alpha = .78$ ).

**Table 5**

Confirmatory Factor Analysis of the Translated variables (N = 200)

| $\chi^2/df$ | CFI | TLI | RMSEA | SRMR |
|-------------|-----|-----|-------|------|
| 2.05        | .95 | .94 | .048  | .036 |
| 1.98        | .96 | .95 | .045  | .034 |
| 2.12        | .94 | .93 | .051  | .039 |

*Note.*  $\chi^2/df$  = chi-square divided by degrees of freedom; CFI = Comparative Fit Index; TLI = Tucker–Lewis Index; RMSEA = Root Mean Square Error of Approximation; SRMR = Standardized Root Mean Square Residual.

The confirmatory factor analyses indicated good model fit for all measures. The K10 showed  $\chi^2/df = 2.05$ , CFI = .95, TLI = .94, RMSEA = .048, and SRMR = .036. The ERQ – Cognitive Reappraisal subscale demonstrated  $\chi^2/df = 1.98$ , CFI = .96, TLI = .95, RMSEA = .045, and SRMR = .034. The ERQ – Expressive Suppression subscale showed  $\chi^2/df = 2.12$ , CFI = .94, TLI = .93, RMSEA = .051, and SRMR = .039. These indices indicate that the translated measures have adequate factorial validity.

## Discussion

The research was a translation and psychometric validation of the Kessler Psychological Distress Scale (K-10) among middle-aged Pakistani adults (N = 200) who had physician-reported chronic conditions (arthritis, migraine, or chronic lower back pain). The descriptive data revealed that the clinical sample was diverse (Table 1), slightly more women were represented (56.5%), the largest part of the sample was represented by the middle socio-economic group (60.0%). On the whole, the measures translated showed satisfactory factorial, internal, and criterion validity (Tables 2 through 5) which validates the use of the Urdu K-10 to measure the extent of psychological distress in this clinical group.

The Urdu K-10 had a unidimensional structure as psychometrically assessed with the supported original scale. The outcome of the exploratory factor analysis was a factor with a single independent variable that explained 54.1% variance, and the outcome of the confirmatory factor analysis was acceptable to good fit ( $\chi^2/df = 2.05$ , CFI =.95, TLI =.94, RMSEA =.048, SRMR =.036). The quality of internal consistency was very high ( $\alpha =.90$ ), and the item-level statistics (items-total correlations) justified the use of the entire 10-item set (see Methods). The results suggest that the translated K-10 is a measure of a coherent construct of nonspecific psychological distress (anxiety/depression symptoms) and, like other cultural-specific validation measures, is similar to previous validations.

ERQ (Gross and John, 2003), using the previously translated Urdu version which was used by Soulat Khan and Rukhsana Kausar (2014), also showed strong psychometric characteristics. The overall ERQ was also very internal consistent ( $\alpha = 0.93$ ). Subscale analyses justified the conceptualization of the two strategies: Cognitive reappraisal (6 items) was good in terms of reliability ( $r =.89$ ) and had sufficient sampling adequacy (KMO=.79; variance explained=51.6) and Expressive suppression (4 items) was acceptable in terms of reliability ( $r=.76$ ) and had adequate sampling adequacy (KMO=.72; variance explained=49.3). Both subscales had confirmatory models that showed acceptable fit (reappraisal:  $\chi^2/df = 1.98$ , CFI =.96, TLI =.95, RMSEA =.045, suppression:  $\chi^2/df=1$ , CFI=.94, TLI=.93, RMSEA=.051) which supported the original two-factor structure in this Urdu-speaking clinical sample.

The Adverse Childhood Experiences (ACEs) checklist (Urdu adaptation by Safdar and Bokhari, 2015) demonstrated a good psychometric behavior: KMO =.76, significant Bartlett test, 62.4% variance explained, and acceptable internal consistency ( $\alpha = 0.78$ ). Since ACE items are binary in nature, KR-20 gives a parallel estimate of internal consistency; in this sample the reliability of the scale was in an acceptable range, meaning the measure makes sense reflecting variability early adversity.

The convergent and discriminant a priori hypothesized relations were also supported by the criterion validity analyses. Expressive suppression ( $r =.45$ ,  $p =.001$ ) and ACEs total ( $r =.42$ ,  $p =.001$ ) were positively correlated with psychological distress (K10), whereas cognitive reappraisal ( $r = -.32$ ,  $p =.001$ ) was negatively correlated with psychological distress (K10). The ERQ subscales had a negative correlation with other subscales ( $r = 0.18$ ,  $p <.05$ ), which is in line with theoretical assumptions that habitual reappraisal and suppression are two different and to some degree opposite strategies. The ACEs also turned out to be positively related to increased reliance on suppression ( $r =.25$ ,  $p <.001$ ) and reduced reappraisal ( $r = -.20$ ,  $p <.05$ ), indicating that childhood adversity is related to increased distress and reduced adaptive ways of emotion-regulation in the adult period. The results of partial correlations that adjusted age, gender, and disease duration were

consistent (see Methods), which suggests that such correlations are strong in the context of demographic and clinical covariates.

The results of the study have some theoretical and clinical implications. The unidimensional K-10 seems to be a valid screening tool to the nonspecific psychological distress in Pakistani middle-aged adults with chronic pain conditions, which can be effectively used to identify clinically significant distress in the medical context. The relationship between the ACEs and heightened distress along with heightened expressive inhibition in addition to reduced reappraisal coupled with heightened susceptibility to affective symptoms are consistent with developmental theories that suggest that early adversity conditions individuals to adopt maladaptive means of control and increases the level of susceptibility to affective symptoms. Clinical implications of these findings include the assessment and treatment of chronic-pain patients, which should consider a history of childhood adversity and emotion-regulation skills; therapies that attenuate distress and enhance coping with chronic illness should involve strengthening cognitive reappraisal and weakening maladaptive suppression (e.g. cognitive-behavioral or emotion-focused therapy).

Much attention should be devoted to cultural context. Culturally relevant assessment was made possible by the ERQ Urdu translation by Soulat Khan and Rukhsana Kausar (2014) and the ACEs Urdu adaptation (Safdar and Bokhari, 2015), though socio-cultural norms in Pakistan (e.g., collectivism, importance of family obligations, stigma over the emotional disclosure) might affect both the manifestation of distress and the reaction to items on the emotion-regulation scales. The lower and acceptable adequacy of the suppression subscale ( $KMO = .72$ ) is in part possibly a cultural difference in normative suppression, or an item interpretation difference; this highlights the significance of qualitative pretesting and further cross-validation in different Pakistani subpopulations. The research has various shortcomings. To begin with, the cross-sectional design does not allow causal conclusion on the temporal correlations between the ACEs, emotion regulation and the present distress. Developmental pathways have to be tested by longitudinal research. Second, it used nonprobability methods to recruit middle-aged adults with particular chronic conditions which could limit the generalizability of the results to other age groups, clinical populations, or geographic areas. Third, data were self-reports, which may generate recall bias (particularly when it comes to ACEs) and social desirability effects; multi-method testing, as well as informant reports, would help to bolster future validations. Lastly, despite the fact that model fit indices were satisfactory, additional research looking into measurement invariance (gender, diagnosis, or educational level) and test-retest reliability would offer more data pertaining to stability and comparability.

K-10 translated into Urdu has excellent factorial validity, high internal consistency and anticipated associations with emotion regulation and childhood adversity in this clinical sample, rendering its application as a screening measure of psychological distress among Pakistani middle-aged adults with chronic physical comorbid disorders. The ERQ Urdu and ACEs Urdu also did well and formed a coherent network of nomologicals. Future studies ought to build on these results by carrying out longitudinal predictive validity, cross-group invariance, and intervention responsiveness studies and incorporating multi-method measures to minimize shared-method variance. The Urdu K-10 can be useful to clinicians who deal with Pakistani patients with chronic pain as they can use it to screen distress on a routine basis and evaluate emotion-regulation strategies and childhood adversity can be used to inform a customized psychosocial interventions.

### Limitations and Suggestions

The cross-sectional design cannot allow making causal conclusions about the temporal connection between childhood adversity, emotion regulation, and psychological distress; longitudinal studies are suggested. Nonprobability sampling and the focus on middle-aged adults with definite chronic conditions could be the factors that restrict the ability to generalize the findings to other age groups, diagnoses, or regions. The use of self-report measures exposes self-report measures to the risk of recall and social desirability bias, especially retrospective ACEs reporting. Future studies must include longitudinal designs, multi-method measures, gender, diagnosis, and educational level measurement invariance testing, and also test test-retest reliability to further demonstrate scale stability.

### Implications

The implications of the findings on research and clinical practice are significant. Urdu K-10 seems to be a valid and effective assessment instrument in terms of diagnosing psychological distress in Pakistani adults with chronic pain in the medical and mental hospital facilities. Distress evaluation and emotion-regulation coping and childhood adversity can be used to inform specific psychosocial interventions, including cognitive-behavioral or emotion-based interventions designed to improve cognitive re-evaluation and decrease maladaptive suppression. The tested Urdu measures offer culturally competent instruments to investigate psychological distress and its developmental co-morbidities, and it will serve as a foundation of longitudinal, cross-cultural and intervention-based studies of Pakistani populations in the future.

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