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The psychometric parameters of the Farsi form of the Kessler Psychological Distress Scale (K10) in psychiatric outpatients

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ABSTRACT

The aim of this study was to describe the psychometric properties of the Farsi form of the Kessler Psychological Distress Scale (K10). The translated Farsi Form of the K10 was used, and administered to a total of 128 Iranian psychiatric outpatients from Tehran. One-week test-retest was 0.85 indicating its high temporal stability. Cronbach's alpha value and Spearman-Brown coefficient of the K10 reached 0.92, Split-Half 0.85, indicating its good internal consistency. The K10 correlated 0.73with the General Health Questionnaire (GHQ-12), 0.80 with the Beck Depression Inventory (BDI-13), 0.29 with the Beck Hopelessness Scale (BHS), 0.42 with the Beck Suicidal Ideation Scale (BSIS), and 0.62 with the Wish to be Dead Scale (WDS) indicating good criterion-related validity. Finally, a principal axis analysis with Varimax rotation was carried out. Two factors were extracted, accounting for 73.22% of the total variance. These factors were labeled: Anxiety (59.07%), and Depression (14.65%). The results indicate that the K-10 administered to this Iranian sample yields good internal consistency, temporal stability, criterion-related validity and a two-factor structure reflecting important features of psychological distress. In general, the K10 could be recommended in research on anxiety and depression among Iranian psychiatric outpatients.

Keywords: Psychological distress, Kessler Psychological Distress Scale (K10), Farsi form, Psychiatric outpatients

INTRODUCTION

Anxiety and mood disorders are common psychiatric disorders in the world. Major depression is a commonly occurring and burdensome disorder [1]. Kessler, Sampson, Berglund, Gruber et al (2015) reported that patterns and correlates of comorbid DSM-IV anxiety disorders among people with DSM-IV major depression disorder (MMD) are similar across World Mental Health (WMH) countries [2]. Kessler and Bromet (2013), Al-Hamzawi, Bruffaerts, Bromet, AlKhafaji and Kessler (2015) indicated that major depressive episode is associated with considerable disability and low treatment in general population [3-4].

Various researches have provided support for the use of the Kessler Psychological Distress Scales (K10/K6) for screening of anxiety and depression disorders on different samples in the most countries. The Kessler Psychological Distress Scale (K10) is a scale was developed and designed by Professor Ronald C. Kessler from Harvard University as part of mental health component of the US National Health Interview Survey in 1992 for mental health screening in population surveys [5]. This is a nonspecific scale based on 10 questions about the level of anxiety and depressive symptoms a person may have experienced during the last 30 days [6].

The K10 questions relate to the level of anxiety and depressive symptoms: "During the last 30 days, about how often… 1) Tired out for no good reason; 2) Nervous; 3) So nervous that nothing could calm down; 4) Hopeless; 5) Restless or fidgety; 6) Restless could not sit still; 7) Depressed; 8) Everything was an effort; 9) So sad nothing can cheer up; and 10) Feel worthless [7-8].

Andrews and Slade (2001) reported that the K10 had many implications, it was related in predictable ways to these other measures, was suitable to assess morbidity in the population, and it was appropriate for use in clinical practice [9]. Andersen, Grimsrud, Myer, Williams et al (2011) evaluated the performance of the K10 in screening for depression and anxiety disorders in the South African population. The K10 demonstrated moderate discriminating ability in detecting depression and anxiety disorders in the general population. The K10 had significantly lower discriminating ability with respect to depression and anxiety disorders among the Black group compared with the combined minority race/ethnic groups of White, Colored, and Indian/Asian [10].

The K10 as screeners for depression (especially for current depression), in the general population is useful [11]. The K10 is being increasingly used for clinical and epidemiological aims. It is a measurement for depressive/anxiety disorder measurement; psychological disorders; and psychological suffering [6, 12-13].

The aim of the present study was to evaluate the psychometric characteristics of Farsi Form of the K10, that is, its reliability, validity and factorial structure in Iranian psychiatric outpatients. In addition, the research sought to identify other psychological variables that are associated with the psychological distress.

MATERIALS AND METHODS

Participants

A convenience sample of 128 Iranian psychiatric outpatients was selected from psychiatric and psychological clinic at School of Behavioral Sciences & Mental Health-Tehran Institute of Psychiatry, Iran University of Medical Sciences (IUMS), Tehran, Iran. The mean age was 33.15 years (SD=13.13); 67.7% of them were female, 45.4% were single; 36.2% had children; the majority (60%) had a lower diploma or higher diploma, 28% BA, 13.1% a MA, and 2.3% PhD degree;70% had average income;19.2% had mood disorders, and 13.1% anxiety disorders, and 3.1% other mental disorders; the mean duration of disorder was 8.42 years (SD=8.80);40.% had a family history of psychiatric disorders; 24.6% had a history of somatic disease; 43.1% received drug therapy, 3.1% psychological treatment, and 30.8% both of them. They responded to the scales in individual sessions.

Measures

The-Kessler Psychological Distress Scale-10 (K10; Kessler et al, 2003) consists of 10 items to screen for mental illness in the general population, scored on a 5-point scale: None of the time (0); A little of the time (1); Some of the time (2); Most of the time (3), and All of the time (4). A typical item is, "During the last 30 days, about how often did you feel nervous?" Kessler, et al. (2003) reported strong correlations with other similar measures and good predictive ability for a diagnosis of psychiatric disorder. Cronbach alphas for the Farsi version of the K10 were 0.88in college students [6], 0.83 [14], and 0.80 [14]. The correlation between the K10 and a love of life score was -0.53[13]. The correlations K10 with the Kessler Psychological Distress Scale-6 (K6) score was r=0.89, and the GHQ-12 score r=0.76 in college students [6, 16].

In the present study, translated Farsi Form of the K10 by Atef Vahid *et al* [6] was used. To estimate there reliability of the K10, split-half and Spearman-Brown coefficients were calculated, as well as the one-week test-retest correlation.

In order to study the construct validity of the K10, 52 psychiatric outpatients also completed the Farsi versions of five scales:

(1) General Health Questionnaire (GHQ-12): The GHQ is used as a mental health screening tool in primary care, general medical practice and community surveys to detect minor and non-psychotic psychiatric conditions. The GHQ-12 is a short version, a quick, screening tool, and has 12 items; answer range is Likert format 0-1-2-3 or 0-0-1-1. It been translated into many countries, validated, and has good item-total correlation There were various factors, good item-total correlation, and high Cronbach's alpha and Spearman-Brown coefficients [17-20].

(2) Beck Depression Inventory short version (BDI-13): The BDI-13 is a tool to measure the severity of depression symptoms**.** It is adequate in assessing the severity of depression in patients with diagnosis of depression. The BDI-13 has 13 items; answer range is Likert format 0-3; and good psychometric properties [21].

(3) Beck Hopelessness Scale (BHS): The BHS is used to measure key aspects of hopelessness such as feelings about the future, loss of motivation, and expectations. It is a 20-item self-report inventory, and answer range is Likert format 1-5. The BHS is a valid and reliable measure [22].

(4) Beck Suicidal Ideation Scale (BSIS): The BSIS consists of 19 items is a brief assessment to help identify individuals at risk for suicide. It has good validity and reliability, and answer range is Likert format 0-2 [23-24].

(5) Wish to be Dead Scale (WDS): The WDS developed by Lester (2013) [25] has 10 items and can be used with two possible formats: a true/false format and a Likert-type response format. The true/false format was used for the present study and is scored true (1) and false (0). The WDS had moderately good test-retest reliability and internal consistency in samples of American undergraduate students enrolled in psychology courses. Cronbach alpha was 0.82, and the two-week test-retest correlation was 0.87. The WDS scores were not correlated with age, but were significantly correlated with a history of suicidal ideation and attempting suicide. A principal components analysis with a Varimax rotation extracted only one factor with eigenvalues greater than 1. All the items loaded on this single factor with factor loadings ranging from 0.36 to 0.83 and a median of 0.65. The correlation between the WDS score and a death obsession score was 0.37 [25], indicating that the two constructs differed substantially. In study of Dadfar et al (in press) [12], a principal components analysis with a Varimax rotation extracted three factors with eigenvalues greater than 1. All the items loaded on these three factors with factor loadings ranging from 0.1 to 0. The correlation between the WDS score and K10 score was 0.52; self-esteem 0.47; hope -0.54; satisfaction with life -0.46; generalized self-efficacy -0.37; love of life -0.35; life orientation -0.33; and happiness -0.20,indicating that the two constructs differed substantially [12].

The mean scores, Cronbach alphas and correlations with K10 scores for the present samples are shown in Table 1.

Table 1 - Kessler Psychological Distress Scale (K10) N=52 psychiatric outpatients

Scales	Mean	SD	Numbers of items	Answer range (Likert format) (False-True)	Cronbach's alpha	Pearson r with K10
General Health Questionnaire (GHQ-12)	18.00	7.94	12	1-8	0.76	0.73**
Beck Depression Inventory (BDI-13)	11.03	7.55	13	0-3	0.86	0.80**
Beck Hopelessness Scale (BHS)	10. 57	2.00	20	1-5	0.64	0.29*
Beck Suicide Ideation Scale (BSIS)	2.78	5.54	19	0-2	0.93	0.42**
Wish to be Dead Scale (WDS)	4.51	2.86	10	False (0)-True (1)	0.83	0.63**

** two-tailed p < .05; ** two-tailed p < .01*

RESULTS

Reliability

The Cronbach alpha for the Farsi version of the K10, and the Split-Half reliability was.92, the Split-Half reliability 0.85,the one-week test-retest reliability 0.85, indicating good reliability.

The inter-correlations between the items (see Table 2) ranged from 0.15 to 0.79, and the item-total correlations ranged from 0.62 to 0.83.

Table 2- Correlations between items and with the total score of the of the Kessler Psychological Distress Scale (K10)

Item	1	2	3	4	5	6	7	8	9	10	Total
1	1										
2	**.757****	1									
3	.273**	**.495****	1								
4	.376**	**.453****	**.578****	1							
5	**.408****	**.482****	**.568****	**.799****	1						
6	.152	.354**	**.794****	**.606****	**.629****	1					
7	**.573****	**.609****	**.520****	**.701****	**.678****	**.524****	1				
8	**.459****	**.518****	**.380****	**.527****	**.606****	**.416****	**.580****	1			
9	.210*	**.331****	**.717****	**.608****	**.584****	**.816****	**.506****	**.438****	1		
10	**.541****	**.586****	**.462****	**.714****	**.631****	**.513****	**.720****	**.555****	**.544****	1	
Total	**.624****	**.730****	**.753****	**.828****	**.832****	**.756****	**.838****	**.720****	**.752****	**.822****	1

***significant at the 0.01 level*
**significant at the 0.05 level*

Factor Analysis

A scree test suggested a strong first factor with a high eigenvalue (lambda 1=5.90) and accounted for 59.07% of the total variance. Therefore, a general factor of K10 could be hypothesized. Scree Plot indicates numbers of extracted factors of the Scale has been shown in Figure 1.

The criteria for a factor analysis were evaluated using Kaiser-Meyer-Olkin Measure of Sampling Adequacy (KMO) and Bartlett's Test of Sphericity. The KMO was 0.878, indicating the adequacy of the sample, and Bartlett's Test of Sphericity (973.666, df=45, p<.001) indicated that the factor analysis was justified. To investigate the factor structure the scale, a Principal Component Analysis with a Varimax rotation and Kaiser Normalization were used.

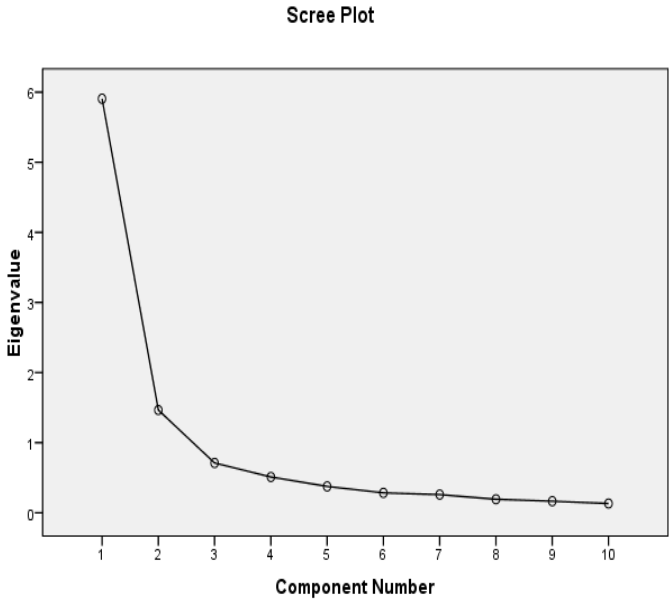

Figure 1- Scree Plot for extracted factors of the Kessler Psychological Distress Scale (K10)

Two components with eigenvalues greater than one were extracted (see Table 3).

Factor 1 (5 items) had an eigenvalue of 5.90, and explained 59.07% of the observed variance. This factor labeled "Anxiety" and included items "During the last 30 days, about how often did you feel so nervous that nothing could calm you down?", "During the last 30 days, about how often did you feel hopeless?", "During the last 30 days, about how often did you feel restless or fidgety?", "During the last 30 days, about how often did you feel so restless

you could not sit still?" and "During the last 30 days, about how often did you feel so sad that nothing could cheer you up?".

Factor 2 (6 items) had an eigenvalue of 1.46, and explained 14.65% of the observed variance. This factor labeled "Depression", and included items "During the last 30 days, about how often did you feel tired out for no good reason?", "During the last 30 days, about how often did you feel restless or fidgety?", "During the last 30 days, about how often did you feel depressed?", and "During the last 30 days, about how often did you feel that everything was an effort?", and "During the last 30 days, about how often did you feel worthless?".

Table 3- Factor loadings (> .5) of the Kessler Psychological Distress Scale (K10) in Iranian psychiatric outpatients (N=128)

Kessler Psychological Distress Scale (K10) Items	Component	
	1	**2**
1. During the last 30 days, about how often did you feel tired out for no good reason?	-.016	**.901**
2. During the last 30 days, about how often did you feel nervous?	.199	**.837**
3. During the last 30 days, about how often did you feel so nervous that nothing could calm you down?	**.816**	.233
4. During the last 30 days, about how often did you feel hopeless?	**.688**	.497
5. During the last 30 days, about how often did you feel restless or fidgety?	**.668**	**.518**
6. During the last 30 days, about how often did you feel so restless you could not sit still?	**.922**	.130
7. During the last 30 days, about how often did you feel depressed?	.487	**.711**
8. During the last 30 days, about how often did you feel that everything was an effort?	.380	**.635**
9. During the last 30 days, about how often did you feel so sad that nothing could cheer you up?	**.880**	.162
10. During the last 30 days, about how often did you feel worthless?	.488	**.683**
Eigen value	5.90	1.46
% of Variance	59.07	14.65
% of total variance	73.72	
Component Transformation Matrix		
1	.73	.67
2	-.67	.73

Factor 1 (items: 3, 4, 5, 6, and 9): Anxiety
Factor 2 (items: 1, 2, 5, 7, 8, and 10): Depression

Construct Validity

The correlations between K10 scores and the scale scores (see Table 1) were: GHQ-12 r=0.73 (p<.01), BDI-13 r=-0.80 (p<.01), BHS r=0.29 (p<.05), BSIS r=0.42 (p<.01), and WDS r=0.63 (p<.01), all in the direction to be expected, thereby indicating good construct validity.

DISCUSSION

The aim of the present study was to explore the reliability of the Farsi version of Kessler's (1992) Psychological Distress Scale (K-10). The K10 had good internal consistency and test-retest reliability in this sample of Iranian psychiatric outpatients. The present study identified two components of the K10 anxiety, and depression (whereas Atef Vahid et al [6] identified a single component in Iranian college students): psychological distress. Thus, the K10 may be comprised of several components, and it would be of interest to explore the correlates of each separately in future research.

The mean score of the sample on the K10 was 19.21 (SD=9.50). It appears, therefore, that elements of the psychological distress are common, at least in this sample.

Scores on the K10 are associated with many measures psychological problems: general health, depression, suicide ideation, and wish to be dead. These associations provide evidence for the construct validity of the K-10. There were also weaker (and significant) associations with hopelessness. It appears, therefore, that the K-10 may be useful for assessing, screening, and for estimating the anxiety and depression disorders.

The study had some limitations. The sample was from a clinical population of psychiatric outpatients. Detecting of depression and anxiety disorders and performing an epidemiological research in the general population using K10 compared with 1-month Composite International Diagnostic Interview (CIDI);Mental Component Summary (MCS)

score; diagnoses of the Diagnostic and Statistical Manual of Mental Disorders, V Edition (DSM-V) Anxiety and Depressive disorders and also assessment the validity of the K10 across important demographic, cultural, and socio-economic groups such as gender and educational history, are recommended. However, results of this study are very interesting and useful, especially for those who are willing to do epidemiological studies. In such studies, due to the large sample size, is required to a screening tool which in addition to having short items can be differentiated depression and anxiety disorders from normal population. The Farsi form of the K10 has both good internal consistency and validity and is shorter than GHQ-12. Epidemiological researchers are well aware of the importance of such tools. The K10, as an appropriate screening tool, can be used by researchers. It is hoped that the study will stimulate further cross-cultural research on the K10, will be useful in future population mental health surveys, and will prove for the identification of subclinical cases.

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