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PSYCHOMETRIC PROPERTIES OF PAKISTANI VERSION OF PERCEIVED STRESS SCALE

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ABSTRACT

The objective of the present study was to translate and adapt Perceived Stress Scale (PSS) in National language (i.e., Urdu). Subsequent to completion of adaptation process, validation (i.e. reliability and validity estimates) of PSS was done on a randomly selected sample of university students ranging in age from 19-30 years. The research measures employed were: Demographic Form, Perceived Stress Scale (PSS) (Cohen, Kamarck, & Mermelstein, 1983), ICP Subjective Well-Being Scale (ICPSWS) (Moghal & Khanam, 2012), and Depression Anxiety Stress Scale (DASS) (Lovibond, & Lovibond, 1995). The findings show good internal consistency, test-retest reliability, Spearman Brown and Guttman Split-Half reliability coefficient. Interpretation of factors analysis is same as the original version of PSS, presenting two factors i.e. Perceived Distress and Perceived Coping. Further, a positive correlation is found between PSS and DASS. The results also show significant correlation between PSS and subscales of ICPSWS i.e. Positive Affect, Negative Affect, and Life Satisfaction. The results of this study indicates that this scale can be used to assess perceived stress among Pakistani population and also provides the basis for further development of stress measures in Urdu language.

Keywords: *Perceived Stress, Translation, Adaptation, Psychometrics*

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INTRODUCTION

Stress is defined as any challenge to the body's homeostatic state or a biological and psychological response to any threat (perceived) and individuals perceived incapability to deal with that perceived threat (McLeod, 2010). According to Cohen, Janacki-Deverts and Miller (2007), this happens when an individual perceives the demands either internal or environmental, exceeding from his or her adaptive capacities and create the threat to one's well-being. Psychological stress can manifest as distress, commonly known as 'good stress' and 'bad stress'.

It is evident from the findings of the study (Cohen, Kamarck, & Mermelstein, 1983) that small amount of stress can be exciting and keeps the person active and alert; however, long term stress may cause various mental health issues or physical illnesses (e.g. elevated blood pressure, susceptibility to infections and depression). Several studies (Brilman & Ormel, 2001; Chou & Chi, 2001; Hammen, 2005; Mazure, 1998) have found the relationship between negative life events, stress and depression showing that 20-25% of people develop depression after experiencing the major stressful events (Monroe & Simons, 1991). It is also evident that external stressors cause several physical health problems such as, blood pressure, high blood glucose and lipids (Selye, 1976), cancer and cardio vascular diseases (Dong et al., 2004; Kivima ki et al., 2006; Li et al., 2002)

Several researchers found that increased level of perceived stress negatively affect students' academic performance and also leads to poor health outcomes, such as poor sleeping and eating habits, consumption of junk foods, drugs and alcohol along with a low self-esteem (Hudd et al., 2000). Suicidal ideation (Hirsch & Ellis, 1996) and smoking are some other negative behaviors noted in student were stressed (Misra et al., 2000). Moreover, it may lead to students drop out from college (Shields, 2001). Due to long term stress, students have difficulty to use their physical and psychological resources adequately and reduce their utilization of coping skills, ultimately increasing the chances of various illnesses (Thoits, 1995).

It is worth mentioning that most of the studies on perceived stress and its impact are done by the researchers outside of Pakistan. Therefore, there is an intense desire to develop psychometrically sound instruments in national language of Pakistan (Urdu) or to translate, adapt and validate the existing instruments in Urdu language with strong psychometric properties. It will enrich the field of

research in the developing country like Pakistan and also flourish cross cultural researches in this region.

Worldwide diversity in population highlights a need for cross-culturally and multi-culturally validated and reliable research instruments in order to measure or to address number of problems among multi-cultural and multinational populations (Souse & Rojjanasrirat, 2010). There are several reasons of adaptation and translation of psychological tests such as to promote comparative ethnic studies that allow people to be evaluated in their national languages; to achieve fairness in assessment and to cut down the cost in terms of time and money for developing the new tests (Hambleton, 2005; Ramsay & Reynold, 2000).

As test construction is an expensive and time-consuming procedure, therefore considering the importance of culturally relevant and psychometrically sound tool in the field of research the present study was planned to translate and adapt the Perceived Stress Scale in Urdu language. This scale was selected because of its effectiveness and worldwide use to measure perception of stress in relation to health related (both mental and physical) outcomes among adults (Cohen, Kamarck & Mermelstein, (1983). The Perceived Stress Scale has also translated in a number of foreign languages including Spanish, Serbian, Korean, Chinese, Thai, Malayalam, Danish, Tamil, Polish, Turkish, Hebrew, Greek, Italian, German, Portuguese, Mexican-, Hungarian and Mexican-Spanish as reported in research studies and on author's website (Cohen, 2013).

METHOD

Participants

The present study was accomplished in two steps. The first step comprised of translation, adaptation and estimation of linguistic equivalence, whereas the second step encompassed estimation of reliability (internal consistency, test-retest and Split-Half), validity (convergent and discriminant) and the factor analysis of Pakistani version of PSS. For the first step i.e. translation, adaptation and estimation of linguistic equivalence, the sample of 32 bilingual students from the University of Karachi, Karachi, Pakistan were selected. For the second step 130 students (116 females & 14 males) were recruited randomly from the same institution mentioned above. Out of 130, 110 were reassessed for test retest reliability. The age of the participants for both steps was ranged between 19 to 30 years.

Measures

Perceived Stress Scale

The Perceived Stress Scale (PSS) (Cohen, Kamarck, & Mermelstein, 1983) consists of 10 statements. The PSS is a self-report measure with a 5-point Likert type scale (4 to 0 i.e., *"Very Often"* and *"Never"* respectively). In order to get total scores, scoring on positive statements (4, 5, 7 & 8) is reversed as 4 = *"Never"* and 0 = *"Very often"*. The sum total score of PSS ranges from 0 to 40, where high scores show greater level of stress. The Perceived Stress Scale-10 is found to be a psychometrically reliable and valid measure. Internal consistency of the PSS is relatively satisfactory i.e. Cronbach's $\alpha = .78$. Regarding construct validity, scores of PSS have found to be associated with self-reported measures of health services, health behavior measures, smoking, and help seeking behavior. For further illustration, high scores on PSS were also found to be correlated with failure to quit smoking, failure to regulate blood sugar levels among people with diabetes, greater susceptibility to develop symptoms of depression elicited by stressful life event, slower wound healing process, and more colds.

ICP Subjective Well-Being Scale

The ICP Subjective Well-Being Scale (ICPSWS) is a psychometrically sound measure developed indigenously in Urdu language by Moghal and Khanam (2012) to measure subjective well-being. It has three subscales named Positive Affect, Negative Affect and Life Satisfaction subscale, in which former subscales are consisted of 12 items, whereas, later one has 5 items. In the subscales of Positive and Negative Affect, participants are asked to exhibit how often they experience certain affects in past four weeks by marking affect statements on a Likert-type scale (ranging from 1= never to 5= always). Life satisfaction subscale has 5 point Likert type scale (1= completely disagree to 5= completely agree). The ICPSWS has good reliability i.e. 77, .73 and .82 for positive affect, negative affect and life satisfaction scale respectively. The Cronbach's alpha is .84, .85 and .80 for positive affect, negative affect and life satisfaction scale respectively.

Depression, Anxiety, Stress Scale

The Depression Anxiety Stress Scale-42 (DASS-42) is a psychological tool to assess the level of distress. This questionnaire consists of three subscales i.e. depression, anxiety and stress. The Urdu version of DASS was used in the study.

Each subscale has fourteen questions with a Likert type scale (0 = *"does not apply to me at all"* and 3 = *"applies to me very much or most of the time"*). In order to define the severity level scores for each DASS subscales, the defined cut-off scores were used, as DASS-42 is not a diagnostic tool of clinical diagnoses.

Procedure

Following steps were taken in the process of translation and adaptation of Perceived Stress Scale:

Formulation of Expert Panel

In present research, four bilingual experts from the faculty of Institute of Clinical Psychology, University of Karachi were included in the committee, as Hambleton's (2005) given criteria that the translators must be highly qualified in the discipline and have greater technical knowledge as well as good understanding of both target and source languages with awareness of both cultures and the constructs of measurement.

Forward and Back Translation

Forward translation is among one of the judgmental designs for test adaptation. For this purpose, the original version of Perceived Stress Scale (PSS) was given to three bilingual experts (PhDs in Clinical Psychology) and one language expert familiar with both relevant cultures. They were requested to translate the original instrument from source language (English) to target language (Urdu). It is worth mentioning that all translators worked independently from each other. After the forward translation, three more bilingual experts (mental health professionals, M.Phil intern and a language expert) were approached for the purpose of back translation. In back translation, the translated version of PSS, was translated back in the source language by different translators, who were not familiar with the original scale. They were requested to adapt the adapted version into source (English) language.

After the translations have been done, the expert panel thoroughly analyzed the translations and made consensus on a final draft of Urdu version of PSS.

Cross Language Validation/Linguistic Equivalence

After completing translation and adaptation phase, a study was conducted to analyze whether the translated version is conceptually equivalent to the original version or not. For this purpose, "Single group bilingual design" was utilized in the study. This design involves the administration of both versions of the scale (original and translated to the target language) to a single bilingual group (Hambleton's, 2005). At this step of the study, a sample of 32 bilingual students was selected from the University of Karachi by using purposive sampling technique. Both versions of PSS (Urdu and English) were administered on the participants with an interval of 10 days (Table 1 & Table 2).

Estimation of Reliability

After completion of the first phase of this study, internal consistency (Table 3), test-retest reliability (Table 4), and Split-half reliability (Table 5) and were measured by conducting various studies. The sample of 32 adults (for internal consistency) and 110 adults (for temporal stability) were selected from the University of Karachi and their ages ranged between 19 till 30 years. This study was conducted with the interval of 14 days averagely.

Estimation of Validity

Convergent validity (Table 9) and Discriminant validity (Table 10) were estimated by administering Depression Anxiety Stress Scale and ICP Subjective Well-being Scale followed by Demographic Form and Perceived Stress Scales on a sample of 130 university students with the age range of 19-30 years.

Factor Analysis

Factor analysis was also calculated through principal component extraction method for the above-mentioned sample with Varimax rotation method (Table 6, 7, 8)

Procedure for Reliability and Validity Estimation

Data for the current study was collected from various departments of University of Karachi, Pakistan. A group of 130 students were randomly selected. After taking informed consent, Perceived Stress Scale (PSS) was administered

followed by Depression Anxiety Stress Scale (DASS) and ICP Subjective Well-being Scale (ICPSWS). Out of 130, 110 students were reassessed for test-retest reliability of the adapted version of PSS. It is worth mentioning that all the administrations were done in a class room setting during University timings.

Data Analysis

The data was analyzed statistically by using the Statistical Package for Social Sciences (SPSS, Version 25.0). Pearson Product Moment Correlation, Cronbach's Alpha, Split-Half reliability, Convergent and Discriminant Validity and Principal Component Factor Analysis were calculated.

RESULTS

Table 1
Linguistic Equivalence of the Adapted and Original Versions of Perceived Stress Scale (N=32)

Scales	Perceived Stress Scale-Urdu
Perceived Stress Scale-Urdu	.83**

***p* <.01

Table 2
Item by Item Cross Language Validation of Urdu and English versions of Perceived Stress Scale (N=32)

Item No.	*r*
1	.50**
2	.80**
3	.33
4	.70**
5	.69**
6	.21
7	-.02
8	.56**
9	.47**
10	.50**

***p* <.01

Table 3
Internal Consistency of Perceived Stress Scale- Urdu Version (N=32)

Number of Items	*α*
10	.83

Table 4
Test Re-test Reliability of Perceived Stress Scale- Urdu Version (N=110)

Time of Administration	*r*	*p*
Perceived Stress Scale - Time 1 Perceived Stress Scale - Time 2	.73	.00**

** *p* <.01

Table 5
Split-Half Reliability of Perceived Stress Scale- Urdu Version (N=32)

	Split-Half Reliability		
Cronbach's Alpha	Part 1	Value	.76
		N of Items	5
	Part 2	Value	.66
		N of Items	5
Total Number of Items			10
Correlation Between Forms			.71
Spearman-Brown Coefficient			.83
Guttman Split-Half Coefficient			.83

Table 6
Kaiser-Meyer-Olkin Measure of Sampling Adequacy (KMO) and Bartlett's Test of Sphericity for Perceived Stress Scale

	KMO	*Sig.*
Perceived Stress Scale	.73	.000*

** p <.001*

Table 7
Eigen Values and Percentages of Variance Calculated by Principal Component Analysis

Components	Initial Eigen Values	% of Variance Explained	Cumulative Percentages
1	2.97	29.73	29.73
2	1.65	16.49	46.22

Table 8
Rotated Component Matrix[a]

Item No.	Component		Factors
	1	2	
PD1	.62		Perceived Distress
PD2	.58		Perceived Distress
PD3	.78		Perceived Distress
PC4		.49	Perceived Coping
PC5		.73	Perceived Coping
PD6	.52		Perceived Distress
PC7		.75	Perceived Coping
PC8		.76	Perceived Coping
PD9	.58		Perceived Distress
PD 10	.59		Perceived Distress

Note: Extraction Method: Principal Component Analysis
Rotation Method: Varimax with Kaiser Normalization.
a. Rotation converged in 3 iterations.

Table 9
Estimation of Convergent Validity of Pakistani version of Perceived Stress Scale (PSS) with Depression Anxiety Stress Scale (DASS) (N=130)

Scales	*r*
Depression Anxiety Stress Scale	.66**
Depression	.54**
Anxiety	.58**
Stress	.67**
Negative Affect (ICP-SWBS)	.60**

** $p < .01$

Table 10
Estimation of Discriminant Validity of Pakistani version of Perceived Stress Scale (PSS) and ICP- Subjective Well-being Scale (ICPSWS) (N=130)

Scales	*r*
ICP Subjective Well-Being Scale	-.03
Positive Affect	-.42**
Satisfaction with Life	-.48**

** $p < .01$

DISCUSSION

Perceived Stress Scale is extensively used psychological tool to assess stressfulness of events, psychiatric diseases, and physical health and stress

management programs with different populations (Malinauskas, 2010; Waldman, 2009; Lane, et al., 2007; Marcus, 2003). Questionnaires and interviews are considered as key tools to analyze and interpret perceived stress in one's life. Due to which, public health researchers desire to assess stress in large groups of participants and in predicting health related outcomes in order to utilize psychological tools that are cost effective in terms of time and money. For this purpose, translation and adaptation of the foreign assessment tool is the one method to maintain accuracy and benefit of time and money. Present study aimed to translate and adapt PSS in Pakistan's national language (Urdu) and to establish its reliability and factor analysis, so that this valuable instrument can be used for general population who cannot understand English language.

After translation and adaptation of PSS in Urdu (targeted language) from English (source language), the linguistic equivalence of the translated version was calculated. In Table 1 results are showing strong correlation between two versions of PSS. Table 2 is also showing item by item cross language validation of the original version and adapted version.

The internal consistency of the adapted Scale was also calculated through Cronbach's alpha. The results are suggestive of strong internal consistency of the PSS- Urdu version (Table 3). The test-retest reliability of the adapted Scale was also calculated. Table 4 show strong positive correlation between the two administrations with 8 days' interval. Split-half reliability assessed by Spearman Brown Coefficient is also showing strong positive relationship between two equal halves of PSS Urdu version (Table 5).

Factor analysis is frequently used as an exploratory and confirmatory technique in scale development. It measures an ability or trait of the scale in order to assure that questions or statements are related to the same construct proposed to measure (Field, 2005). Factor analysis was also applied on PSS with the same intention. Initially, sampling adequacy was checked empirically by applying Kaiser-Meyer-Olkin (KMO) and Bartlett tests of sampling adequacy. The KMO showed good and satisfactory sampling adequacy. Bartlett test of sphericity is also found to be significant which shows that data is suitable for analysis (Table 6).

The 10 items version of PSS was factor analyzed and the principal component matrix was obtained to establish the factor structure of adapted version of PSS in Pakistani culture on the data of 110. Results shown in Table 7 are indicative of three factors; however, Extracion Sums of Squared Loading has

endorsed the presence of two factors with variance of 29.73 and 46.22 respectively, as in the original version of PSS.

Similarly, Rotated Component Matrix in Table 8 also indicative of 3 iterations. It is also confirmed the presence of 2 factors of "Perceived Distress" and "Perceived Coping" on the basis of negative and positive items respectively. However, item 10 (negative item) also showing that participants perceived it as positive item but it has weak iteration in relation to the factor of "Perceived Distress".

Findings (Table 9) revealed a moderate positive correlation between adapted version of Perceived Stress Scale (PSS) and Depression Anxiety Stress Scale (DASS) and also with Negative Affect (subscale of ICP SWS). Further, findings are evident of insignificant correlation between PSS and ICP Subjective Well-being Scale (ICP SWS); however moderate negative correlation was found between PSS and Positive Affect; and between PSS and Satisfaction with Life subscale (Table 10).

In conclusion, adequate estimates of reliability, validity and factor analysis of Pakistani version of Perceived Stress Scale (PSS) recommended that this scale can be helpful to assess the perception of stress in Pakistani population. This scale will also provide the basis for further development of Stress Scales for adolescents and adults in Pakistani culture. This adapted Urdu version may also facilitate psychologists, psychiatrist and other mental health professionals to analyze and interpret levels of perceived stress, mechanism of stress appraisal and coping deficits among different populations in Pakistani society. It will also be useful in future studies to explore the etiological factors of stress and may provide the basis for determining its solution.

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