



Original article

Assessment of Occupational Stress using Punjabi Version of Perceived Stress Scale (PSS-10) in Punjabi Population

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ABSTRACT

Background: The occurrence of occupation related stress is being increasingly reported now days. The perceived stress scale (PSS-10) is the most commonly used psychological instrument to measure perceived stress. **Aim:** The aim of the study was to develop and translate the PSS-10 in Punjabi language and assess its psychometric properties in the study population. **Methodology:** The cross-sectional study was conducted on a sample population of 100. The translated Punjabi PSS-10 and the original English version were randomly given to the participants. **Results:** The internal consistency reliability, test-retest reliability and correlation between the Punjabi and English version of the PSS-10 were assessed using Cronbach's alpha coefficient and Spearman's correlation coefficient respectively. For assessing the validity of translation, Kappa coefficient for intra-rater reliability was used. The test retest – reliability(ICC) after 3 weeks was 0.935. The sample adequacy was assessed by the Kaiser-Meyer-Olkin was 0.733 (KMO. $p < 0.05$ was considered to be statistically significant. The mean \pm SD of Punjabi PSS-10 score was 22.29 ± 3.69 , with Cronbach's alpha coefficient value to be (0.98) of the scale. The mean PSS score was higher in housewives followed by assistant professors, organization employees, business owners, academic administrators, graduate students and research scholars. Inter-rater reliability was measured using Cohen's kappa coefficient. All the items ranged between (0.746-0.891), were found to have a significant κ , demonstrating a strong agreement between items of two PSS-10 versions. **Conclusion:** The Punjabi version of PSS-10 demonstrated satisfactory psychometric properties and its further use in research and psychology related practices is recommended.

KEYWORDS: Punjabi translation, perceived stress scale(PSS-10), Occupation, stress

INTRODUCTION

Stress in general and occupational stress in particular, is a fact of modern day life that seems to have been on the increase. The topic is therefore still popular, although it occupies academicians' and practitioners' attention now for more than half a century [1]. Occupational (job, work or workplace) stress has become one of the most serious health issues in the modern world [2], as it occurs in any job and is even more present than decades ago[1]. Occupation related stress among working people is drastically increasing worldwide. Stress at work place has become an integral part of everyday life and is referred as 'worldwide epidemic' by the World Health Organization [3].

As stated by Kumar and Suresh (2010)[4], Occupational stress (job stress) is a psychosocial disorder which is the result of interaction between the worker and his/her work environment. If left unidentified it can cause serious physical and physiological illness to the individual. Occupational stress may occur due to stress factors at the

individual level, or at the organization level or at the interface of the two. The degree of stress is related to the intensity of threat and to the beliefs and expectations that individuals believe may be achieved or thwarted[5]. Previous Studies have demonstrated that perceived stress is associated with premature death and adversely affects quality of life[6,7]. The importance of research on perceived stress suggests the need for valid and reliable instruments to measure and assess global perceptions of stress [8].

Accurate measurement of psychological perceived stress is essential for better understanding of the susceptibility and treatment of psychological distress[9]. The Cohen Perceived Stress Scale (PSS) is one of the most widely used instrument for measuring psychological perceived stress. Numerous studies have supported the validity and reliability of the Cohen PSS in variety of samples [10-12]. The Cohen PSS has also been shown to relate to a number of physiological responses [13,14]. The Cohen PSS was originally developed

in 1983 as a 14-item Likert type questionnaire out of which four questions were dropped as they did not load on either of the two factors obtained using exploratory factor analysis for the PSS-14[15]. The PSS-10 then developed, was found to have adequate validity and a slightly higher internal reliability than PSS-14 (Alpha coefficient of 0.78 vs. 0.75) [16]. The 10 items in the scale inquire about feelings and thoughts that tap the degree to which respondents find their current life situation unpredictable, uncontrollable and stressful.

The scale correlates with different psychosocial measures specifically depression, anxiety, and perception of poor health as well as with decreased satisfaction with self, job and life in general [10,17]. The PSS-10 has been translated to different languages including Arabic, Spanish, Turkish, Mexican Swedish, Greek, Bulgarian, Chinese, Thai, Japanese, Persian, Hungarian, Malaysian and Bengali

MATERIALS AND METHODS

Participants:

A total of 100 individuals aged 20-65 years, both genders (50 males and 50 females) participated in this cross-sectional study. This research protocol was approved by Institutional Ethical Committee of Faculty of Sports Medicine and Physiotherapy, Guru Nanak Dev University, Amritsar. Participants were recruited from various places (e.g., university, teaching hospital, private organizations) and neighborhoods in Amritsar city. Demographic characteristics including educational level and employment status of the participants were obtained on their first day of contact [20]. All the participants who were able to read, understand and write both English and Punjabi languages were included in the study after obtaining the informed consent from them. Study procedures were explained to all the participants in detail. Punjabi and English version of the scale was handed over to an individual in a random order. Completed questionnaire was collected after 24 hrs and then the other version was given to the same participant [19].

Instruments:

In the Cohen PSS-10 questionnaire participants were asked to respond to each question on a 5-point Likert scale ranging from 0 (never) to 4 (very often), indicating how often they have felt or thought a certain way within the past month. Scores can range from 0 to 40, with higher composite scores indicative of greater perceived stress. The PSS-10 was translated from the original English version into Punjabi language by two native Punjabi speaking psychology professors working independently of each other, after which both conversations were matched and a final common translation was reached. [19]. The final translation was translated back into English language by two literary experts from the linguistic department and item-by-item translation-retranslation were compared with the original version[21]. Seven research assistants were asked to fill PSS-10 Punjabi version and translation was found to be satisfactory based on the results. After an average of 3 weeks from the completion of the first testing, a second Punjabi PSS questionnaire was given to each participant for completion. Confidentiality of participants was assured

[16,18,19]. In India, the PSS-10 has been translated in Bengali language and validated among medical students and the results suggested good performance of the scale in assessing perceived stress among them[19]. However, the psychometric properties of PSS-10 have not been evaluated in context to occupational stress in India.

To the best of our knowledge, no study has translated Cohen PSS questionnaire in Punjabi language, a language spoken by nearly 130 million native speakers worldwide and validate it among Punjabi speaking population to assess the perceived stress among different occupational groups. Assessment of perceived stress using Cohen PSS-10 is essential in order to inculcate effective interventional programs and coping strategies aimed at reducing stress among Punjabi speaking population residing across the globe.

by the use of identification codes which were known only by one of the authors[22].

Statistical Analysis

All the analyses were performed with SPSS version 17.0 (SPSS Inc., Chicago, IL, USA). Descriptive statistics for continuous variables were reported as means and standard deviations. Post hoc one way ANOVA was performed for any significant difference in the stress mean values across different occupational groups. The internal consistency reliability was assessed using Cronbach's alpha coefficient. Test - retest reliability and correlation between the items of the Punjabi and English version of the PSS-10 were assessed using Spearman's correlation coefficient respectively. For assessing the validity of translation, Kappa coefficient for intra-rater reliability was computed [19]. To analyze the construct structure of Punjabi version of PSS-10, exploratory factor analysis (EFA) was performed using principal component with varimax rotation [16]. The sample adequacy was assessed by the Kaiser-Meyer-Olkin (KMO) [21]. $p < 0.05$ was considered to be statistically significant.

RESULTS

100 participants volunteered in this cross-sectional study. The mean age of the participants was 37.47 ± 13.029 , with a range of 20-65 years. The participants were divided into 7 occupational categories namely, business owners, organization employee, academic administrators, graduate students, research scholars, assistant professors and house wives. The descriptive characteristic of the participants is presented in [table-1]. The mean \pm SD of Punjabi PSS-10 score was 22.29 ± 3.69 , with internal consistency (Cronbach's alpha coefficient) value to be (0.98) [table-2] of the scale. Similarly, the mean \pm SD of original English PSS-10 score was 22.79 ± 3.52 , with internal consistency (Cronbach's alpha) value to be (0.966).

The mean PSS score was higher in housewives followed by assistant professors, organization employees, business owners, academic administrators, graduate students and research scholars [table-3]. However, post hoc one way ANOVA did not show any significant difference in the PSS mean values between different groups of the study ($p=0.551$).

Table: 1 descriptive statistics of the study groups

Occupation	Number of participants(n=100)	Percentage (%)	Mean age \pm SD (years)
1. Business Owners(N=8)			
Males	7	7	52.14 \pm 7.988
Females	1	1	51 \pm 0
2. Employee(N=34)			
Males	26	26	44.07 \pm 9.153
Females	8	8	36.375 \pm 11.11
3. Academic Administrators (N=6)			
Males	6	6	62.33 \pm 1.032
Females	0		0
4. Graduates(N=17)			
Males	5	5	21.4 \pm 1.14
Females	12	12	22.5 \pm 1.930
5. Researchers(N=18)			
Males	2	2	26 \pm 0
Females	16	16	26.375 \pm 1.63
6. Assistant Professors(N=6)			
Males	4	4	33.4 \pm 4.966
Females	2	2	37 \pm 1.41
7. Housewives(N=11)			
Males	0	0	0
Females	11	11	43.54 \pm 6.933

The Cronbach's alpha coefficient value was found to be highest in assistant professors followed by graduate students, academic administrators, business owners, organization employees, house wives and research scholars [table-2]. At 3 weeks test-retest reliability, the intra class correlation coefficient (ICC) was calculated and found to be good. (ICC=0.935). All the items of Punjabi PSS-10 were found to be significantly correlated to the original version of Cohen's PSS-10 ($p < 0.01$) [table-3], this proves the concurrent validity of the translated Punjabi PSS-10 version.

Inter-rater reliability was measured using Cohen's kappa coefficient. All the items ranged between (0.746-0.891), were found to have a significant κ , demonstrating a strong agreement between items of two PSS-10 versions [table-4]. Further, the test-retest reliability of the Punjabi pss-10 questionnaire was found to be 0.935.

The adequacy of the sample was confirmed by Bartlett's test of sphericity. It was found to be statistically significant ($p < 0.01$), and the Kaiser-Meyer-Olkin (KMO) value was 0.733. The varimax rotation also showed that the

Punjabi PSS and the English PSS have almost the same loading except for item 5[table-4].The Exploratory factor analysis showed that rotated factor solution for Punjabi PSS-10 and English PSS-10 contained three factors with eigen value more than 1.0,[Wang,2011] which accounted for 52.091% and of the total variance.

This was supported by the scree plot placing factors in decreasing number of eigen value [19] [figure-1] Factor-1 and 2 represented "negative feelings" [21]. Factor 1 contained item 1 and 2 with eigen value of 2.689 and accounting for 26.889% of variance. Factor 2 consisted of items (3,6,8,9,10) out of which item 8 presented positive feelings only, with eigen value of 1.352, accounting for 13.52% of variance. Factor 3 consisted of item (4,5,7) representing " positive feelings", with eigen value 1.168 and accounted for 11.682% of variance [table-5]. In the original Cohen's PSS-10, the three factors yielded eigen values of 2.679,1.406 and 1.154, accounting for 26.786,14.063 and 11.544% of variance respectively performed in our population.

Table :2 Intra class correlation coefficient (ICC) and cronbach's alpha for Punjabi pss-10 overall and within each occupational group

Occupation	Mean \pm SD of PSS Score	Crochbach's Alpha	ICC(95% OF CI)	Significance
Business Owners(N=8)	22.38 \pm 4.93	0.986	0.930-0.997	p<0.01
Employee(N=34)	22.59 \pm 3.42	0.984	0.968-0.992	p<0.01
Academic Administrators (N=6)	22.33 \pm 3.08	0.988	0.914-0.998	p<0.01
Graduates(N=17)	21.71 \pm 4.54	0.989	0.969-0.996	p<0.01
Researchers(N=18)	21 \pm 3.46	0.972	0.925-0.990	p<0.01
Assistant Professors(N=6)	22.83 \pm 4.11	0.996	0.970-0.999	p<0.01
Housewives(N=11)	24 \pm 3	0.980	0.924-0.995	p<0.01
Total Score PSS-10	22.29 \pm 3.694	0.984	0.977-0.989	P<0.01

Table :3 Spearman's correlation coefficient of English pss-10 items with Punjabi pss-10 items

ENGLISH PSS-10	PUNJABI PSS-10(rho value)
ITEM-1	0.934*
ITEM-2	0.914*
ITEM-3	0.870*
ITEM-4	0.939*
ITEM-5	0.817*
ITEM-6	0.813*
ITEM-7	0.857*
ITEM-8	0.900*
ITEM-9	0.871*
ITEM-10	0.952*
TOTAL SCORE	0.430*

* Significant at p<0.01 level 2-tailed

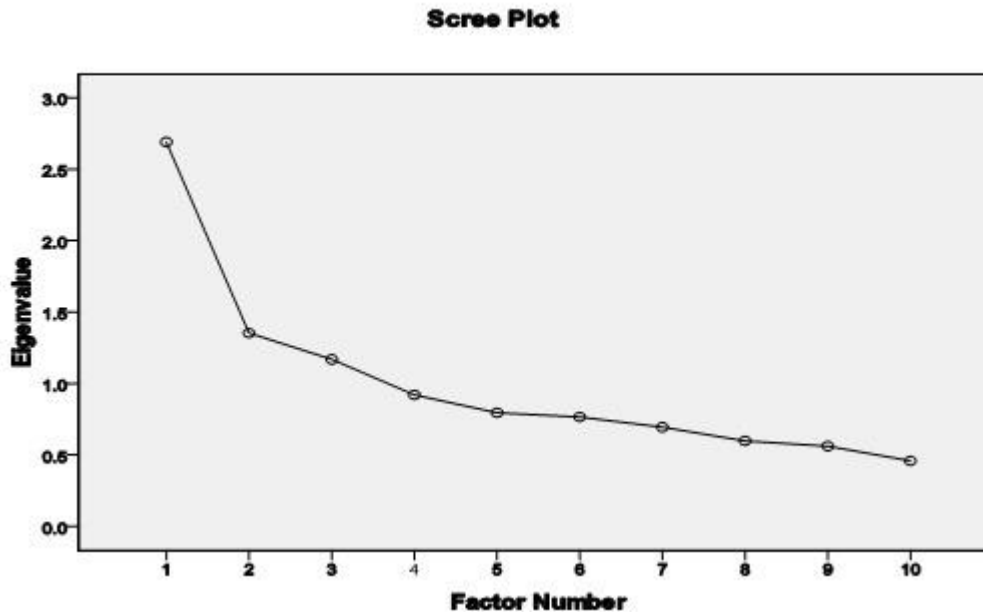
Table : 4 Inter-rater reliability of Punjabi PSS-10 and comparison of the item composition of factor analysis results using exploratory factor analysis with varimax rotation of Punjabi pss-10and English pss-10.

Items Of Punjabi PSS-10	Kappa Value	Factor-1	Factor-2	Factor-3	Items Of English PSS-10	Factor-1	Factor-2	Factor-3
Item-1	0.891	.455	.190	.103	Item-1	.414	-.022	.214
Item-2	0.832	.526	.408	-.082	Item-2	.709	.053	.047
Item-3	0.746	.217	.487	.019	Item-3	.155	.455	.160
Item-4	0.841	-.391	-.138	.246	Item-4	-.428	-.099	.232
Item-5	0.779	-.317	-.025	.071	Item-5	-.349	.221	-.039
Item-6	0.765	-.096	.501	.014	Item-6	.302	.413	.070
Item-7	0.847	-.166	-.065	.981	Item-7	-.381	.210	.679
Item-8	0.847	-.476	.111	.109	Item-8	-.320	.434	-.607
Item-9	0.828	.077	.482	-.290	Item-9	.357	.370	-.304
Item-10	0.839	.444	.508	-.107	Item-10	.613	.206	-.708

Table :5 Factor structure of Punjabi pss-10 using exploratory factor analysis with varimax rotation.

Component	Initial Eigen value Total	Percentage of Variance	Extraction Sums of Squared Loadings Total	Percentage of Variance	Rotation sums of squared loading Total	Percentage of Variance
1	2.689	26.889	2.053	20.533	1.251	12.506
2	1.352	13.520	.628	6.277	1.216	12.165
3	1.168	11.682	.940	9.401	1.154	11.540
4	.920	9.198				
5	.795	7.948				
6	.765	7.651				
7	.694	6.938				
8	.598	5.976				
9	.561	5.612				
10	.459	4.586				

Figure: 1 Scree plot indicating probable three factor structure of scale



DISCUSSION

The aim of this study was to translate and validate the Cohen Punjabi PSS-10 among Punjabi speaking population of Punjab, India. For this purpose, 100 participants belonging to different occupational streams were enrolled for the study. The results of the study reveal that Punjabi version PSS-10 seems to be a valid instrument with adequate psychometric properties for the studied population. This is the first study where reliability of Cohen's PSS-10 was assessed among different occupational groups in Punjab, India. PSS-10 has been translated and validated in different languages around the world. The overall Cronbach's alpha value of Punjabi version PSS-10 was 0.984 and was comparable with that of English PSS-10(0.966) applied in our population. This value is higher than the findings of other studies, where reliability coefficient ranged from 0.78-0.91[21].

The internal consistency of the scale was high and the reported correlations with measures of anxiety, depression, and self esteem supported the concurrent validity of the scale.[23] The mean scores were highly comparable to the original scale by Cohen[10].PSS-10 has also been translated in bengali language and used among medical students in India [19]. Also, in the current study, 3 latent factor structures were found. The 3 factor structures were related to positive and negative feelings. This was unlike other language version studies where 2 related factor structures were found [21]. In addition, the exploratory factor analysis yielded similar results in comparison to the Cohen's original PSS-10 in our population. The English PSS-10 yielded eigen values of 2.679,1.406 and 1.154, accounting for 26.786,14.063 and 11.544% of variance respectively. Also, when results of varimax rotation of English and Punjabi version PSS-10 were compared, the loading of items was similar in both except of item 5.

Also, it was clear from our study that housewives had higher mean PSS score as compared to other occupational categories. The finding was supported by Soomro et al(2012)[24], where level of depression was found to be higher in housewives as compared to working women. Furthermore, it has also been reported that housewives have more of emotional incompetence as compared to working women this may be due to educational and economic empowerment of the working women and more participation in the society as compared to less educated housewives who deal with their own household tasks[25]. He further added that married women who are not working are more distressed than working women as they have to stay at home taking care of children and doing household chores because housework is a low-prestige, invisible, ungratifying work for which one receives few rewards. Employed women are expected to be less psychologically distressed than housewives because they have two sources of potential gratification (work and family) instead of one; they have more prestige, power, and personal economic resources than housewives; they are less socially isolated than housewives; and they receive more gratification from their occupational roles than housewives receive from housework.

Also, results from the current study indicate teaching job (as assistant professors) to be a stressful job. There exists a substantial body of literature describing teaching as a stressful occupation and suggesting that teacher stress appears to be an increasing problem[26-33]. In recent time, several studies have examined occupational stress in the teaching profession. Studies have suggested that teachers experience disproportionately high levels of stress[34-35].A number of factors have been shown to influence teachers' decisions about staying on or leaving the profession, including job

stress, job satisfaction, resilience, and self-efficacy[36,37]. Typically, they include stressors in the areas of work role (e.g., workload); administration; class size; role ambiguity and conflict, the pressures of the teachers' roles; poor working conditions; little recognition and low remuneration; lack of involvement in decision-making; student recalcitrance; lack of effective communication, as well as the many emotional demands of teaching [38-41].

Similarly, Academic administrators were also found to have a high score on perceived stress scale. Causes of high perceived stress could be the responsibility for a number of activities in the educational sector, ranging from the development of policy to the development and review of course curricula and teaching materials so, patience, vision, crises management ability and accomplished of task are almost unavoidable traits. Academic manager can take best decision, if they are psychologically healthy and strong. In such a complex scenario, management may seriously be affected by the occupational stress[42].

The results of the current study highlight the need to introduce interventional programs and strategies to cope up with the increasing stress posed due to high occupational demands. Varvogli and Darviri (2011)[43] has suggested progressive muscle relaxation, autogenic training, relaxation response, biofeedback, emotional freedom technique, guided imagery, diaphragmatic breathing, transcendental meditation, cognitive behavioral therapy, mindfulness-based stress reduction and emotional freedom technique as some of the commonly used evidence-based techniques. These techniques are easy to learn and practice and have reported good results in both health and diseased population. Regarding test retest reliability, we found Punjabi PSS-10 demonstrated high reliability of the scale(0.935) at 3 weeks interval. Therefore, with adequate sample size and applicability of the questionnaire in the general population as the strength to support the validity, the current study identified the occupations posing high stress demands on the Punjabi asian population with the Punjabi PSS-10 scores.

Limitation of the study is that the validity of the current study and relationship between Punjabi PSS-10 score were not associated with sex, socio economic status and medical history. Future studies are suggested to find out the causal relationship of perceived stress among various occupations in context to gender specification and to establish test-retest reliability of the questionnaire in a large sample population.

CONCLUSION

Stress is considered to be one of the main causes of various diseases like diabetes, hypertension, depression etc. The Punjabi PSS-10 has good internal consistency and reliability. The availability of validated Punjabi PSS-10 would help in establishing a link between stress and other diseases. It would also help in establishing its value in cross cultural studies. Hence, it can be a useful tool to measure perceived stress in Punjabi dominant population.

SOURCE OF SUPPORT

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CONFLICT OF INTEREST : None

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