

ORIGINAL ARTICLE

**CONCURRENT VALIDITY OF THE MALAY VERSION OF
PERCEIVED STRESS SCALE (PSS-10)**

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Abstract

Objective: This study aimed to assess the concurrent validity of the Malay version of the Perceived Stress Scale (PSS-10) PSS-10 item. **Methods:** A cross-sectional study was conducted among all students in a medical faculty in Malaysia. The questionnaire included three parts; socio-demographic correlates, PSS-10 and the validated Malay version of Depression Anxiety and Stress Scale-21 item (DASS-21). Spearman's correlation coefficient was used in the analysis. **Results:** Stress subscale of DASS -21 correlated positively with the total score of PSS-10 ($r= +0.50, p<0.001$), positively with the negative subscale of PSS-10 ($r= +0.36, p<0.001$) and negatively with the positive subscale of PSS-10 (perceived coping) ($r= -0.33, p<0.001$). **Conclusion:** The Malay Version of PSS-10 has fair correlation with the stress subscale of DASS-21. This confirmed the concurrent validity of this scale, which further strengthened the previous evidence that the Malay version of PSS-10 was a valid tool to measure stress in Malaysian university students. *ASEAN Journal of Psychiatry, Vol. 15 (1): January – June 2014: 8-13.*

Keywords: Malay, Version, Stress, Medical, Students, Psychological Distress

Introduction

Psychological stress is an important health issue due to its association with many adverse health outcomes including cardiovascular disease, cancer and premature death [1-3]. Previous studies reported that 47.6% of medical students in Malaysia [4] and 61.4% of medical students in Thailand were subjected to a significant level of perceived stress [5] during their training. Lazarus and Folkman (1984) defined stress as an interaction between the individual and the environment (stressors) which is appraised by the individual as

threatening or overwhelming his resources and well-being [6]. Accordingly, both internal and external conditions must exist for a stress response to occur. This explains why individuals can respond differently to the same stimulus. People will tend to manifest different interpretations and coping styles in each situation (stressor) depending on their history, experiences and personal characteristics [7]. Perceived Stress Scale (PSS) was developed by Cohen et al (1983) [8] to measure stress in a way that reflects the definition by Lazarus and Folkman (1984) [6]. This validated and reliable self-reported questionnaire had been

used in various clinical settings, cultures and populations and was translated and validated in many languages, including Chinese (Mandarin) [9], Greek [10], Japanese [11], Portuguese [12], Thai [13] and Malay [14].

An earlier study investigated the factor structure, internal consistency and reliability of the Malay version of the PSS-10 item questionnaire among the Malaysian medical students. It was found that the Malay version of PSS-10 item questionnaire had the same factor structure as the original English version with satisfactory internal consistency and test-retest reliability [14]. However, no study was conducted to assess the concurrent validity of the Malay version of PSS-10 item for evaluating all the psychometric properties of this scale. The present study was conducted to assess the concurrent validity of the previously used Malay version among medical students. This study was a part of a larger project aimed at investigating the level of stress, sleep disorders, anxiety and depression among medical students in Malaysia.

Methods

This cross-sectional study was conducted among medical students in a private university in Malaysia. All the 406 were approached. Approval was obtained from the Ethical Committee of the university. Permission for access to the students before or after a lecture was obtained from the coordinators and lecturers. They were assured regarding their freedom to participate in this study and their participation would not affect their progress in the course. Confidentiality was assured and a written consent was obtained from each of the participants. The questionnaire was pilot tested on ten students who were not participating in the study.

Instruments

Perceived Stress Scale (PSS-10)

Perceived Stress Scale-10 (PSS-10) is used to measure the degree to which one perceived one's life as stressful. Here, the participants are asked to respond to each question on a 5-point Likert scale ranging from 0 (never) to 4 (very often), indicating how often they had felt stressful within the past month. The scores ranged from 0 to 40, where higher scores

indicated greater perceived stress [15]. Six out of the 10 items of PSS-10 are considered negative (1 - 3, 6, 9, 10) and the remaining four as positive (4, 5, 7, 8) which represented 'perceived distress' and 'perceived coping' respectively [15].

The PSS-10 had demonstrated good internal (intra-observer) reliability with Cronbach's alphas ranging from 0.78 to 0.91 and test-retest reliability coefficients ranging from 0.55 to 0.85 [8]. The Malay version of PSS-10 used in this project was the same version used in a previous study [14]. The process of translation and validation of the Malay version was summarized in the prior article. The factor analysis of the Malay version of PSS-10 showed two latent factors (positive and negative) and the test-retest analysis was also found of good reliability [14]. The negative factor was named 'perceived distress' while the positive factor was named 'perceived coping'.

The Depression, Anxiety and Stress Scale (DASS-21)

The Depression, Anxiety and Stress Scale - 21 Item (DASS-21) is a set of three self-report scales designed to measure the negative emotional states of depression, anxiety and stress. Each of the three DASS-21 scales contains seven items [10]. Subjects are asked to indicate the extent to which they experience each of the items on a 4-point Likert scale ranging from 0 (Did not apply to me at all) to 3 (Applied to me very much, or most of the time). Previous studies on the psychometric properties of DASS-21 showed that this scale was a reliable and validated measure to be used for clinical [16] and non-clinical samples [17]. It was used as a gold standard to assess the concurrent validity of PSS-10 item in the literature [10]. The Malay version of DASS-21 had good psychometric properties for the Malaysian general population [18-20].

Statistical analysis

Data analyses were performed by using the Statistical Package for Social Sciences (SPSS) version 16.0 for windows. The two positive and negative factors of PSS-10 were obtained by summing the positive items (item items 4, 5, 7 & 8) and the negative items (items 1, 2, 3, 6, 9, 10) respectively. Total scores for PSS-10 were obtained by summing across all the 10

items after reversing the scores on the four positive items. The stress subscale of DASS-21 was used in the analysis for the purpose of concurrent validity assessment. Scores for stress subscale of DASS-21 were calculated by summing up the scores for relevant items. Each score obtained was multiplied by 2 to calculate the final score as DASS-21 was a shorter version of DASS-42 [10]. Normality statistical test for PSS-10 and stress subscale of DASS-21 showed abnormal distribution for both scales. To assess the concurrent validity of PSS-10, Spearman's coefficient was used for comparison. Cronbach's alpha coefficient of the PSS-10 was obtained for internal reliability. A *p-value* <0.05 was considered as statistically significant.

Results

Socio-demographic characteristics

Among a total of 406 questionnaires distributed, 390 were returned by the students in filled-up form. Four questionnaires were excluded from the study due to incomplete data. Hence, a total of 386 questionnaires were finally analyzed for this study (95% response rate). The Majority of the participants were female (70.5%), single (96.6%) and Malay (60.1%) with a mean age of 21.9 (SD=2.8). More than half were in the preclinical phase of medical school (58.5%) (Table 1).

Table 1. Socio-demographic characteristics of the participants (n=386)

		N	%
Gender	Male	114	29.5
	Female	272	70.5
Age	≤21	210	54.4
	>21	176	45.6
Marital status	Single	373	96.6
	Married	13	3.4
Race	Malay	232	60.1
	Chinese	17	4.5
	Indian	121	31.3
	Other	16	4.1
Phase of study	Pre-Clinical	226	58.5
	Clinical	160	41.5

Table 2. Descriptive statistics from the scores of PSS-10 and stress subscales of DASS- 21

	Mean	SD	Minimum	Maximum
Stress subscale of DASS-21	15.5	10.0	0.0	48.00
Total score of PSS-10	20.4	4.9	0.0	40.00

Internal consistency of the PSS-10

Cronbach's alpha coefficient was 0.72 for the total scale, 0.73 for the first factor and 0.74 for the second factor. The value of Cronbach's alpha did not improve by eliminating any of the individual items.

Concurrent validity: correlation between PSS-10 and DASS-21

Descriptive results of PSS-10 and stress subscale of DASS-21 (mean, SD, minimum and maximum) are presented in table 2. The

total score of PSS-10 correlated positively and significantly with the score of stress subscale of DASS-21 ($r= 0.50, p< 0.001$). The negative subscale of PSS-10 (perceived distress) correlated positively and significantly with the score of stress subscale and the total score of DASS-21 ($r= 0.36 p< 0.001$). Positive subscale of PSS-10 (perceived coping) was correlated negatively and significantly with score of stress subscale of DASS-21 ($r= -0.33, p< 0.001$) (Table 3).

Table 3. Correlation between the scores of PSS-10 and subscales of DASS- 21

	Total score of PSS-10	Negative subscale of PSS-10 (perceived distress)	Positive subscale of PSS-10 (perceived coping)
Score of stress subscale in DASS- 21	0.50	0.36	-0.33
	P<0.001*	P<0.001*	P<0.001*
*Spearman correlation			

Discussion

The ultimate validity of a scale is its criterion validation by making comparisons to the gold standard. This first study in Malaysia was designed to assess the concurrent validity of the Malay version of the PSS-10 scale. Here, DASS-21 was used as the reference or “gold standard” as it appeared to exhibit a more stable and distinct factor structure in comparison to the longer version (DASS-42) [21].

This study reported that PSS-10 score correlated positively with the stress subscale of DASS-21. This confirmed the concurrent validity of PSS-10 scale. A prior study found that PSS-10 score correlated positively and moderately with stress measured by 'Live-Event Scale'. The mean PSS-10 score was significantly lower among those who indicated that they had 'ever experienced stress' in comparison to those who said there were things in life that were upsetting or bothersome [22]. Other studies on PSS-10 in different languages had shown that PSS-10 had concurrent validity with a number of measures including the Beck Anxiety Inventory, Beck Depression Inventory (BDI)[9], State-Trait Anxiety Inventory (STAI), Thai Depression Inventory (TDI) [13] and DASS-21[10].

In the current study, when the two factors of PSS-10 were separately tested for correlation with stress subscale of DASS-21, the positive subscale (perceived coping) correlated negatively with the stress subscale of DASS-21 while the negative subscale (perceived distress) correlated positively. Similar results were reported by Andreou et al (2011)[10]. The opposite correlations of the positive and negative factors of PSS-10 with this variable provided further strengthened the evidence of manifestation of two factors in PSS-10 and its

concurrent validity. The strength of this study is represented by the anticipated direction of correlation between the variables and its statistical significance. Although, the moderate and weak values could be an issue in this study, we can argue that our finding is consistent with the literature. Yu and SC (2010) examined the correlation between the PSS-10 and the Trait Anxiety Inventory (TAI) and found $r = 0.53$. In the same study, the correlation coefficient (r) between PSS-10 and menopausal symptoms ranged from 0.18 to 0.41. The authors described that correlation as "adequate correlation" and accordingly they concluded that the concurrent validity of PSS-10 was confirmed [23]. Furthermore, Leung et al (2010) confirmed the concurrent validity of the PSS-10 depending on a correlation coefficient of $r = 0.24$ between the PSS-10 and depression scale [24].

Limitations

This study was cross-sectional in nature. Hence, there was no scope for us to confirm the predictive validity of this scale. The study sample was exclusively made up of students from a single university. This may restrict the generalizability of the findings from this study. In addition discriminant validity of the questionnaire was not investigated in this study.

Conclusion

The Malay version of PSS-10 has fair correlation with the stress-subscale of DASS-21. This confirms the concurrent validity of this scale. The results of this study further strengthen previous evidence that the Malay version of PSS-10 is valid and suitable as a research tool to measure stress in Malaysian university students. It is recommended that the validity of this scale be further tested in the

general population and other professional undergraduate schools.

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