

Translation Equivalence and Psychometric Properties of the Perceived Stress Scale Among Georgian Participants

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Abstract

Background: The Perceived Stress Scale 10 item (PSS-10) has been translated into more than 30 languages and used widely in different populations. The PSS-10 has not previously been translated or psychometrically validated in Georgia.

Aim: Therefore, the present study provides the first Georgian version of the instrument and evaluates its psychometric properties.

Methods: This study translated the PSS-10 into Georgian and assessed Georgian version of the PSS-10 items among 20 Georgian participants.

Results: The study found that PSS-10 retained the original meaning and was understood by Georgians participants. An exploratory factor analysis of the PSS-10 yielded a two-factor structure, and these two factors were significantly correlated (0.56, $p < .01$) with all item loadings exceeded 0.50. The Cronbach's alpha for the PSS-10-GEO was 0.82, and the test-retest correlation at one month's interval was 0.499.

Conclusions: Findings from this study suggest that the PSS-10-GEO has acceptable validity and reliability levels among Georgians participants. The PSS-10-GEO can be used to measure perceived stress in future research and practice. However, future research would be useful to further endorse the validity and reliability of the PSS-10-GEO. (TCM-GMJ August 2026; 11 (3): P30-P34).

Keywords: Georgian, Perceived Stress Scale, Reliability, Validity.

Introduction

Stress has been linked with a number of health issues including hypertension [1], coronary heart disease [2], stroke [3], cancer [4], diabetes [5], anxiety [6], and depression [7]. Because of genetic, biological factors and sex hormones, women are more likely to experience stress than men [8, 9]. This difference has been reported among women, who are older, widowed, have a disability, are members of a minority ethnic group, poorly educated, and living in undesirable conditions and poverty [8, 9].

Concerning stress measurement, Cohen [10] has suggested that measuring stress as an appraisal of events rather than measuring the events themselves is likely to be sensitive, reliable and less limited to a specific group of participants or contexts. So, stress appraisal instruments have

been widely used in a variety of research settings [2, 11, 12]. One popular stress appraisal instrument is the Perceived Stress Scale 10 items (PSS-10) [13]. The Perceived Stress Scale (PSS) has been validated and used in a variety of population groups and translated into over 30 languages with internal consistency estimates using Cronbach's alpha ranging from .67 to .91 [14–16], and test-retest reliability ranging from .53 to .83 [14–16]. The PSS-10 has been found to provide better predictions for psychological symptoms and utilization of health services than other similar instruments [14, 17].

Traditionally, stress is part of life, from traffic jams to family demands to everyday diabetes care [18].

The Perceived Stress Scale (PSS-10) is one of the most widely used and reliable instruments for assessing perceived stress. Since there is no Georgian version of this instrument, therefore, the aim of this study was to translate the PSS-10 into Georgian and evaluate its psychometric properties. It is anticipated that the development of a valid and reliable Georgian version (PSS-10-GEO) will create new research opportunities and contribute to a better understanding of stress perception in the Georgian population, which remains understudied.

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Methods

The translation process included forward translation (with reconciliation), backward translation, cognitive interviews (patient testing), and proofreading.

In the forward translation phase, two independent translators produced separate translations of the original items. These were then discussed with a local coordinator to develop a reconciled pooled version, ensuring conceptual equivalence and clarity for the target population.

In the backward translation phase, the reconciled version was translated back into the source language by an independent translator (native speaker of the source language), bilingual in the target language blinded to the original questionnaire to assess the degree of equivalence between the target version and the original source version of the questionnaire.

In Phase 3, cognitive interviews were conducted with native speakers of the target language to assess comprehension and interpretation of the questionnaire items. Participants were asked about any difficulties, and alternative wording was explored where necessary, leading to the development of Version 3.

Finally, in Phase 4, the questionnaire was proofread by a native speaker of the target language proficient in English, resulting in the final Georgian version of the instrument.

Participants

The study involved 20 volunteers. Eligibility criteria included: (1) 21 years old and above; (2) able to give informed written consent.

Procedure

A total of 20 participants took part in the study. Informed written consent was provided prior to data collection.

Study limitations

Several limitations should be noted. First, the scale was tested for the psychometric properties in Georgian participants and therefore the generalizations of the current study may not be applicable for other population groups. As a qualitative step was not performed to evaluate the content's relevance of the scale to Georgian culture, relevance of the content of the instrument to measure the perceived stress concept among Georgian participants is unclear. Also, as psychometric study findings could not be compared across genders, and age groups. Further, the current study used self-reported measures, recall and reporting bias may occur. In addition, data stemmed from a small group and therefore prospective predictive validity of the PSS-10 could not be performed.

Instruments

The Perceived Stress Scale (PSS) [13] was developed to appraise whether participants considered their life to be unpredictable, uncontrollable, or overloaded. Originally, the instrument had 14 self-report items [13] and included both negatively and positively worded items, but it has more recently been shortened to 10 items and 4 items without loss of fidelity [14]. In each question, the respondent is asked how often they felt a certain way and how often they have experienced particular thoughts and feelings during the last month. Responses are rated from 0

(never) to 4 (very often). Total scores are calculated by reverse-scoring the positively stated items (items 4, 5, 7, and 8; 0=4, 1=3, 2=2, 3=1, 4=0) and summing all item responses. The PSS-10 [17] is summed to provide possible scores between 0 and 40 with higher scores indicating greater perceived stress. Scores of 0–13 are considered low stress, 14–26 moderate stress, and 27–40 high perceived stress.

The scale was originally validated in a sample of 2,387 participants in the United States with a reported Cronbach's alpha of 0.78. It has been validated and used in a variety of population groups and translated into over 30 languages [10]. Cronbach's alphas have ranged from 0.67 to 0.91 [14], and test-retest reliabilities of > 0.70 [14].

Statistical data analysis

Data analysis was performed using the Statistical Package for Social Sciences SPSS 22.0. Descriptive analysis was used to describe the continuous variables; frequency and percentage were used for categorical variables [21].

The sample adequacy was also assessed by the Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy. Initial determination of the appropriate number of factors to retain was assessed with the Kaiser criterion of eigenvalues [24] and a scree plot [25]. For the eigenvalue criterion, factors with eigenvalues larger than 1 were kept [24]. For the Scree test, the number of factors is determined by locating the last substantial leap in the magnitude of the eigenvalues in the plot [25]. Items with a loading of .4 and above were accepted [23,26]. Principal Axis Factoring extraction [15] with Promax rotation methods [27] were applied in EFA. Based on a previous study finding, it was expected that PSS-10-GEO would have two factors [14]. Then, simple regression data analysis was used to explore the correlation between PSS-10-GEO and age, mental and physical health. Significance was set at $p = .05$ [21]. The internal consistency values were assessed using Cronbach's alpha [28]. It was determined that if the Cronbach's alpha reached 0.7 or above [29], the tool would be deemed to have internal consistency. Further test-retest reliability over one month was assessed using a Spearman R correlation [21].

Results and discussion

Translation equivalence

Two independent forward translations of the PSS-10 were produced by native Georgian translators fluent in English. These translations were carefully compared item by item by the translators and a local coordinator. The main differences between the versions were related to word choice and minor variations in sentence structure. Through consensus, a reconciled forward translation was developed, with only minor modifications required.

A backward translation of the reconciled Georgian version of the PSS-10 was subsequently performed by an independent professional translator, a native English speaker fluent in Georgian. The translator was blinded to the original questionnaire and had no prior involvement in the forward translation process. The purpose of this step was to assess conceptual equivalence between the Georgian translation and the original English version.

Overall, the backward-translated version demonstrated a high level of conceptual equivalence with the source instrument. Most items closely matched the original in terms of meaning, intent, and time reference (e.g., “during the last month”). Minor differences in wording and sentence structure were observed; however, these were stylistic in nature and did not alter the conceptual meaning of the items. For instance, variations such as “felt upset about something that happened unexpectedly” versus “been upset because of something that happened unexpectedly,” and “could not cope with everything that you were to do” versus “could not cope with all the things that you had to do,” were considered equivalent in meaning.

Item 7 showed a slight expansion in the backward translation (“control irritation and negative emotions”) compared with the original wording (“control irritations in your life”), although the core concept of emotional regulation remained unchanged. Similarly, item 8 (“you were in control of the situation”) was regarded as conceptually equivalent to “you were on top of things.”

No discrepancies requiring modification of the Georgian forward translation were identified. The backward translation confirmed that the reconciled Georgian version accurately reflects the conceptual content of the original PSS-10 items. Based on these findings, the translation was considered suitable for progression to the subsequent stages of linguistic validation.

During the data collection phase, cognitive testing of the translated questionnaire was conducted with a sample of 20 participants representing the target population. Following minor wording adjustments, participants reported that the items were clearer and easier to understand. Based on their feedback, Item 8 was revised to enhance its clarity while maintaining conceptual equivalence with the original version.

Some participants reported that the wording of this item was not immediately clear and required additional clarification. Following an alternative explanation of the item, participants indicated that its intended meaning became clearer and easier to understand. The revised formulation facilitated a better understanding of the underlying concept, particularly the perceived ability to control situations and events in one's life.

In particular, the revised formulation facilitated better comprehension of concepts related to the perception of control over life situations and events. These observations were documented and may inform future refinements of the translated instrument.

The third (reconciled) version of the Georgian PSS-10 questionnaire subsequently underwent proofreading by an independent professional proofreader, a native Georgian speaker proficient in English. This step aimed to ensure linguistic accuracy, grammatical correctness, clarity of expression, and consistency in terminology across all items. Particular attention was given to maintaining conceptual equivalence with the source instrument while ensuring that the language remained natural and comprehensible for the Georgian-speaking population.

No major conceptual changes were introduced during proofreading. Following the incorporation of the proofreader's recommendations, the final Georgian version of the PSS-10 was established. This version is considered linguistically accurate, culturally appropriate, and conceptually equivalent to the original instrument, making it suitable for use in the target population.

Internal consistency and test-retest reliability

The Cronbach's alpha value for the PSS-10-GEO among participants was 0.82 (95%CI – 0.76-0.89). The questionnaire was administered again a month later (time point 2) on a sample of all original participants. The majority had completed primary school (33.3%, $n = 6$), were not currently employed (25.0%, $n = 5$), had a moderate income or less (75.0%, $n = 15$). The test-retest correlation coefficient was 0.559 ($p = 0.010$) at the one month follow up.

Correlations of PSS-10-GEO total score with age, gender, physical and mental health were examined to confirm external validity. In the study group, a significant association of the PSS-10-GEO total score was revealed with age ($R = 0.525$, $p = 0.018$), female gender ($R = 0.467$, $p = 0.038$), physical ($R = 0.059$, $p = 0.806$) and mental health ($R = 0.048$, $p = 0.841$) the correlation was not significant.

The PSS-10 is one of the most widely used generic measures of stress, having been translated into more than 30 languages and used in different populations [14]. However, this is the first study to translate rigorously PSS-10 into Georgian and to examine the translation equivalence, and to evaluate psychometric properties of the PSS-10-GEO in Georgian participants. The PSS-10-GEO is available on request from the first author. Overall, findings from this study suggest that the PSS-10-GEO attained very good translation equivalence. All items had loadings exceeding 0.50 on one of the two factors identified in this current study. This finding indicated that all items contributed significantly to measuring the perceived stress concept among the participants.

However, previous studies indicated that Factor 1 included 6 items about general distress; Factor 2 included 4 items about ability to control. Inconsistently, the current study found that Factor 1 factor included 8 items, and Factor 2 included 2 items.

Two items (“felt that things were going your way” and “felt that you were on top of things”), which were loaded on Factor 2 in previous studies, were in Factor 1 in the current study. This difference might be related to the socio-economic background of the study participants and the cultural differences in the interpretation of these two items' content. As seen in the descriptive statistics, the majority of study participants had low education, and income. In addition, currently, there is very limited support from the Government for study participants in Georgia. Furthermore, generally Georgian people believe in Orthodox principles, which indicate it is your fortunate destiny to have “things going your way” or “being on top of things”. For these people, these two items may be about how things happened to them but not about their ability to

control them. In addition, traditionally, Georgian patients were taught “to obey their fathers when they are young, obey their partners when they get married, obey their son when their partners pass away”. This tradition of Georgian people may have contributed to Georgian participants avoiding confrontation, or to be less involved in fighting for the best options. These factors therefore could explain why these two items dropped from the Factor 2. This concept we met only in a few works [30]. It would be useful to test if there are significant differences in distress, and coping behaviours across gender, age groups, education levels, incomes and religions in future studies.

Apart from the difference in the factor loading, the current study finding is consistent with previous findings, indicating a significant correlation between factors ($R=0.499$). Previous studies also reported a strong correlation between two factors among Chinese policemen ($r = -0.47$) [31] and among Chinese cardiac patients ($r = -0.57$) [32]. This strong correlation suggests that there might be an overlap among the items in these two factors. In addition, only two items for Factor 2 appear not strong enough to use as a subscale [33]. A further analysis of internal consistency reliability of these two items found a Cronbach's alpha of 0.55. This value indicated a low reliability of a subscale having only these two items. Therefore, caution is necessary with using two dimensions of the construct as subscales individually. This finding supports Cohen's (the original developer of the instrument) recommendation to use all 10 items to measure perceived stress rather than the statistically indicated sub-scales individually [13].

In regards to the correlates, in line with previous studies, the current study found small correlations between perceived stress and physical health [34], and sleep disturbance [35], and large correlations between perceived stress and depression [36–38]. While the magnitude of the corre-

lation between perceived stress and mental health was large in a previous study [34], it was moderate in the current study. These findings suggest that the influences of perceived stress on mental and physical health were weak among Georgian participants.

Finally, the internal consistency reliability value of the PSS-10-GEO (alpha coefficients = 0.82), which was found in this study, is comparable with other studies' findings [14] and passed the desirable value [29]. However, the test-retest reliability value of the Georgian participants, which was found in this study, was lesser than previous studies' findings ($0.559 < 0.700$) [14]. Previous studies measured test-retest reliability of PSS-10 at only 1 and 2 weeks' interval. Consequently, the participants may have still remembered what they had answered in the first round. In contrast, the current study measured the test-retest reliability a month time apart. Hence, the participants' experience of stress may have changed in a month. Therefore, the length of time for test-retest might be the reason why the test-retest reliability in this study was lesser compared to previous studies' findings.

Conclusion

The current study provides robust evidence that the PSS-10-GEO has acceptable validity and reliability levels Georgians and can be used to measure stress in future research and practice among Georgian participants. The use of the PSS-10-GEO provides a valuable opportunity to explore perceived stress and its correlates in different Georgian populations. Moreover, as the PSS-10-GEO now has been translated and validated in more than 30 languages, use of PSS-10-GEO will provide additional opportunities for cross-cultural comparison studies between Georgians and people from other cultures. However, future studies would be beneficial to further endorse the validity and reliability of the PSS-10-GEO.

Table 1. The test-retest correlation coefficients for each item and overall score of the Georgian version of the Perceived Stress Scale 10 (PSS-10-GEO, n = 20) at the one month follow up.

#	Question	R	P
a.	been upset because of something that happened unexpectedly?	0.560	0.010
b.	felt that you were unable to control the important things in your life?	0.581	0.007
c.	felt nervous and “stressed”?	0.645	0.002
d.	felt confident about your ability to handle your personal problems?	0.455	0.044
e.	felt that things were going your way?	0.571	0.009
f.	found that you could not cope with all the things that you had to do?	0.743	<0.001
g.	been able to control irritations in your life?	0.541	0.014
h.	felt that you were on top of things?	0.743	<0.001
i.	been angered because of things that were outside your control?	0.498	0.025
j.	felt difficulties were piling up so high that you could not overcome them?	0.561	0.010
	Overall	0.559	0.010

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