

**SUMMARY ON THE VALIDITY STUDY OF THE
HUNGARIAN VERSION OF THE PERCEIVED STRESS SCALE**

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Abstract:

We studied the characteristics of the Hungarian version of the Perceived Stress Scale (PSS, Cohen et al., 1983) based on data from 217 persons willing to participate in a stress-management program (Williams LifeSkills Program). The shorter versions of the questionnaire (PSS10, PSS4) were strongly correlated ($r = 0,99$ and $0,93$) to the original 14-item questionnaire (PSS14), the internal consistency of all three versions was very good (the Cronbach-alfa were respectively $0,88$; $0,85$; $0,79$), and their test-retest reliability was also excellent ($r = 0,90$). Gender, age and school degree did not influence significantly the total score, while we found different mean scores in our different subsamples: health professionals (physician, nurse, psychologist) scored lower than the “normal” and student groups, patients with somatic disease (cancer) scored higher, and the highest scores were reached by the group of psychiatric patients (the presenting symptom for most of them was anxiety).

We also confirmed the validity of the questionnaire in comparison with other known psychological scales. We found moderately strong correlation between PSS and subjective somatic symptoms (PHQ), the WHO Well-Being Scale and the shortened Cook-Medley Hostility scores; the correlation was stronger with depression (Shortened Beck Depression Inventory, BDI) and anxiety (Spielberger Trait Anxiety Inventory, STAI-T) scores: the correlation coefficients were between $0,52$ and $0,85$. These results indicate that although there is a connection between perceived stress and diverse psychic and somatic symptoms, the variable measured by PSS is a distinct indicator, appropriate for estimating chronic stress as a risk factor.

Study sample

The Hungarian version of the PSS was validated in the framework of an efficacy-study of a stress-management program (Williams LifeSkills Program), in which 217 persons participated. 206 respondents filled out completely our test battery, 75 of them completed the measurements both before and after the intervention. In the reliability analysis of the 14-, 10- and 4-item version of the PSS, we used the data of these later as of different people's responses so as to get more data (N=292) for these examinations. For characteristics of our sample, see Table 1.

Table 1. Sample characteristics		
Subsamples	General community	32.7 %
	Student	10.6%
	Health care professional	32.3%
	Outpatients of a psychosomatic ambulance	13.4%
	Cancer patients	11.4%
Age (in years)	Mean	38.8
	SD	13.4
	Min.	20.0
	Max.	82.0
Sex	Male	30.4%
	Female	69.6%
Education	Elementary / technical school	1.9%
	High school	36.9%
	College / university degree	60.8%
Marital status	Single	36%
	Live with spouse	41%
	Live with companion	8.3%
	Divorced	12.9%
	Widowed	1.8%

Instruments

Besides the Hungarian versions of PSS, questionnaires measuring general well-being, anxiety, depressive symptomatology, hostility, and psychosomatic symptoms were completed. We summarised in Table 2 the internal consistency of our instruments.

General psychological well-being was measured by a shortened, 5-item version of the WHO Wellbeing Questionnaire (Bech, Staehr-Johansen, & Gudex, 1996). The psychometric properties of its Hungarian version were described on the basis of a national representative health survey by Susánszky et al (2006).

Anxiety was assessed with the Hungarian version (Sipos & Sipos, 1983) of the „trait” part (STAI-T) of Spielberger’s State-Trait Anxiety Inventory (Spielberger et al, 1970). To measure trait hostility a shortened, 5-item version of the Cook-Medley Scale was used with a 4-point likert-scale (Kopp et al, 2000; Rózsa et al, 2003).

Depressive symptoms were measured by the 9-item shortened version of the Beck Depression Inventory (Beck et al, 1961). The Hungarian version with a four point rating scale was validated in both general population and on clinical samples earlier (Rózsa et al., 2001).

To measure psychosomatic complaints the Somatic Symptom Severity Scale (PHQ-15, Kroenke et al, 2002) derived from the full Patient Health Questionnaire (PHQ) was used. The list of symptoms covers the most prevalent DSM-IV somatisation disorder somatic symptoms (e.g. headache, stomach ache, diarrhoea).

Table 2. Instruments for comparison	
Measure	Cronbach-alpha
WHO Well-Being Index	0,82
STAI-T	0,85
BDI	0,68
Cook-Medley	0,88

Results

No significant differences were found in PSS-scores between males and females, among age groups and among groups based on educational level (for detailed descriptive data, see Table 3.A.B.C.).

Table 3A. Mean PSS scores and standard deviation (according to gender)							
	Males (N = 63)		Females (N = 143)		Total (N = 206)		
	M	SD	M	SD	M	SD	Cronbach- α
PSS-14	26.0	9.5	26.5	8.5	26.4	8.8	0.88
PSS-10	17.9	7.4	18.2	6.5	18.1	6.8	0.85
PSS-4	6.5	3.4	6.7	3.2	6.6	3.2	0.79

Table 3B. Mean PSS scores and standard deviation (according to age groups)								
	Age under 25 years (N = 34)		26-35 years (N = 60)		36-45 years (N = 51)		Age over 46 years (N = 61)	
	M	SD	M	SD	M	SD	M	SD
PSS-14	26.9	7.6	25.3	7.7	27.1	9.1	26.4	10.15
PSS-10	17.9	6.1	17.4	5.9	18.9	7.0	18.3	7.8
PSS-4	6.8	3.1	6.2	3.1	7.0	3.1	6.6	3.6

Table 3C. Mean PSS scores and standard deviation (according to level of education)								
	Elementary or trade school (N = 4)		Technical school (N = 27)		High school (N = 48)		College / university (N = 126)	
	M	SD	M	SD	M	SD	M	SD
PSS-14	28,5	6,2	30,2	10,6	26,9	7,8	25,3	8,6
PSS-10	19,8	4,3	21,1	7,8	18,6	6,1	17,2	6,7
PSS-4	8,0	2,0	8,3	3,5	6,8	3,0	6,2	3,2

Temporal consistency of the PSS was tested on an other smaller sample ($N_{\text{total}} = 23$, $N_{\text{male}} = 8$; $N_{\text{female}} = 15$; $M_{\text{age}} = 42$ years, $SD_{\text{age}} = 12$ years) with a 5-day-interval. The test-retest correlation was 0.90 ($p < 0.001$) in case of both three versions.

Pearson-correlation coefficient proved to be 0.99 ($p < 0.001$) between the 10-item shortened and the whole version of the PSS. Between the 4-item and the whole version r was 0.93 ($p < 0.001$). For data about the scale analysis of the PSS-14 see table 4.

Table 4. Scale analysis (items are listed in order of the item-total correlations)				
Item	Corrected item-total correlation	M	SD	Cronbach's Alpha if item deleted
PSS 02	0.72	1.87	1.08	0.86
PSS 06	0.68	1.18	0.85	0.86
PSS 14	0.68	1.70	1.07	0.86
PSS 05	0.66	1.47	0.87	0.86
PSS 10	0.60	1.74	0.89	0.86
PSS 08	0.60	2.16	1.09	0.86
PSS 04	0.59	1.29	0.80	0.87
PSS 09	0.59	1.28	0.75	0.87
PSS 01	0.57	2.25	0.91	0.87
PSS 07	0.56	1.62	0.83	0.87
PSS 13	0.47	1.47	0.94	0.87
PSS 11	0.45	2.25	0.87	0.87
PSS 03	0.35	2.48	1.45	0.88
PSS 12	0.23	2.89	0.85	0.88

As a results of the unrotated main component analysis of the whole version, two factors emerged with eigenvalue over 1.0. The main one explained 41,6% of the total variance, while the other 10,9%. For scree plot and factor loadings, see Figure 1. and Table 5.

Figure 1. PSS14 main component analysis

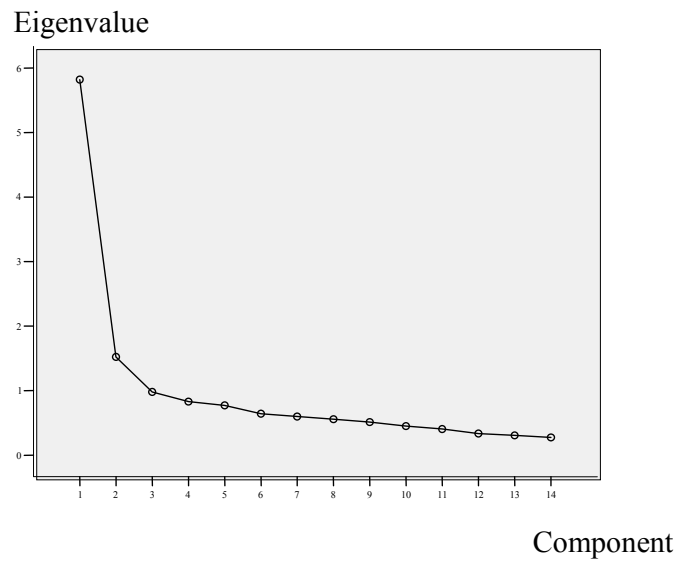


Table 5. Factor analysis for PSS14
(only factor loadings over 0.3 are displayed)

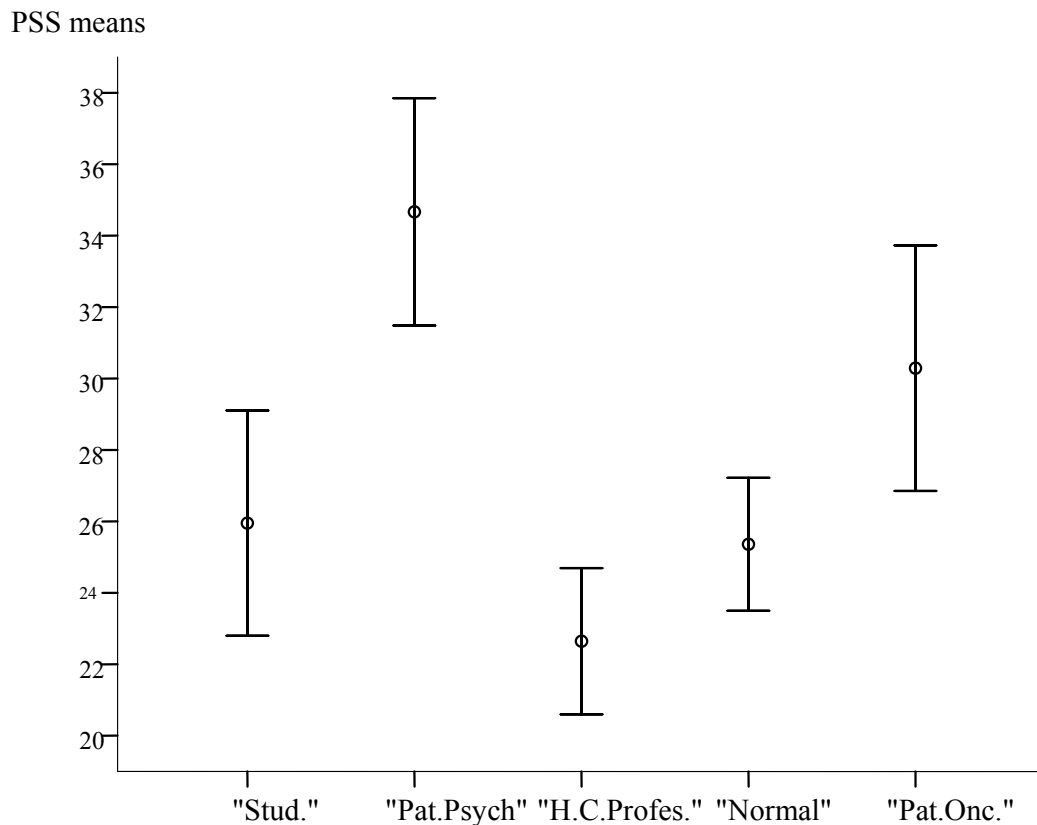
	Component	
	1	2
PSS 06	,786	-,316
PSS 02	,778	
PSS 05	,762	-,309
PSS 14	,730	
PSS 10	,710	-,339
PSS 04	,697	
PSS 09	,688	
PSS 07	,664	
PSS 08	,657	,311
PSS 01	,613	,355
PSS 13	,552	
PSS 11	,504	,300
PSS 03	,400	,369
PSS 12		,717

Our analysis showed significant differences in PSS-scores between the subgroups (Table 6.) of our sample. F-values of the one-way ANOVA for the 14-, 10-, and 4-item versions are: 12.8; 12.5; 11.6 respectively; $p < 0,001$. Figure 2. shows 95% confidence intervals for means of our subsamples.

Table 6. Analysis of discriminative validity: PSS scores in diverse subpopulations										
	"H.C.Profes." (N = 65)		"Stud." (N = 21)		"Normal" (N = 69)		"Pat.Onc." (N = 24)		"Pat.Psych." (N = 27)	
	M	SD	M	SD	M	SD	M	SD	M	SD
PSS-14	22,6	8,3	26,0	6,9	25,4	7,8	30,3	8,1	34,7	8,0
PSS-10	15,3	6,4	17,3	5,6	17,5	6,0	21,1	6,0	24,3	6,0
PSS-4	5,3	2,9	6,4	2,8	7,0	3,0	7,7	2,8	9,6	3,3

Note. „Stud.” = student; „Pat.Psych” = outpatient of a psychosomatic ambulance; „H.C.Profes.” = health care professional; „Normal” = general community; „Pat.Onc.” = cancer outpatient

Figure 2. PSS means and 95% CI for the subsamples



Note. „Stud.” = student; „Pat.Psych” = outpatient of a psychosomatic ambulance; „H.C.Profes.” = health care professional; „Normal” = general community; „Pat.Onc.” = cancer outpatient;

For intercorrelations of our variables, see Table 7. (breakdown by sex).

Table 7. Concurrent validity analysis – intercorrelations table								
	PSS_14	PSS_10	PSS_4	BDI	WB	STAI_T	PHQ	HOST
PSS_14		,99	,92	,72	-,71	,86	,62	,57
PSS_10	,99		,94	,71	-,72	,85	,59	,58
PSS_4	,95	,96		,65	-,68	,79	,51	,55
BDI	,73	,76	,78		-,57	,75	,66	,52
WB	-,77	-,77	-,78	-,77		-,66	-,57	-,28
STAI_T	,81	,81	,80	,85	-,76		,65	,58
PHQ	,63	,64	,58	,62	-,66	,66		,31
HOST	,52	,52	,57	,61	-,61	,65	,47	
Note. PSS-14/10/4: 14-, 10-, and 4-item version of the Perceived Stress Scale; BDI: Shortened Beck Depression Inventory; WB: 5-item version of the WHO Well-being Index; STAI-T: Speilberger’s Trait Anxiety Inventory; PHQ: Patient Health Questionnaire / Somatic Symptom Severity Scale; HOST: Shortened Cook-Medley Hostility Scale Numbers in the upper right corner are results for women; under the diagonal, for men. Level of significance in all cases: $p < 0.001$								

Conclusions

The Hungarian version of the Perceived Stress Scale (PSS, Cohen et al., 1983) shows very good internal consistency, test-retest reliability, discriminative and concurrent validity, for all three versions (PSS14, PSS10, PSS4) , that are highly intercorrelated.

The PSS is an appropriate instrument for estimating chronic stress as a risk factor for diverse psychological and somatic symptoms in the Hungarian cultural contexte as well.

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Hungarian version of the PSS

Az Észlelt Stressz Kérdőív magyar változata

Az alábbi kérdések azokra az érzésekre és gondolatokra vonatkoznak, amelyek Önt AZ ELMÚLT HÓNAP SORÁN jellemezték. Kérjük, hogy minden egyes kérdésnél írja be, hogy az elmúlt hónap során MILYEN GYAKRAN volt jellemző Önre az adott érzés vagy gondolat!

Néhány kérdés ugyan hasonlóknak tűnik, de valójában különbözőek, ezért kérjük, hogy valamennyit külön kérdésként kezelje! A legjobb, ha minden kérdésre gyorsan válaszol. Tehát ne próbálja megszámlolni, hogy hányszor érezte magát egy adott módon, hanem írja be azt a választ, ami a leginkább jellemzőnek tűnik!

	Soha	Szinte soha	Néha	Elég gyakran	Nagyon gyakran
1. Az elmúlt hónap során milyen gyakran volt feszült valamilyen váratlan esemény miatt? ¹⁰	0	1	2	3	4
2. Az elmúlt hónap során milyen gyakran érezte úgy, hogy képtelen kézben tartani azokat a dolgokat, amelyek fontosak az életében? ^{10,4}	0	1	2	3	4
3. Az elmúlt hónap során milyen gyakran érezte magát idegesnek és „stresszesnek”? ¹⁰	0	1	2	3	4
4. Az elmúlt hónap során milyen gyakran kezelte sikeresen a hétköznapi bosszúságokat?	0	1	2	3	4
5. Az elmúlt hónap során milyen gyakran érezte, hogy sikeresen meg tudott küzdeni fontos változásokkal az életében?	0	1	2	3	4
6. Az elmúlt hónap során milyen gyakran bízott magában, hogy képes megoldani személyes problémáit? ^{10,4}	0	1	2	3	4
7. Az elmúlt hónap során milyen gyakran érezte úgy, hogy a dolgok az Ön kedve szerint alakulnak? ^{10,4}	0	1	2	3	4
8. Az elmúlt hónap során milyen gyakran érezte úgy, hogy nem tud eleget tenni minden kötelezettségének? ¹⁰	0	1	2	3	4
9. Az elmúlt hónap során milyen gyakran tudta kezelni a bosszúságokat életében? ¹⁰	0	1	2	3	4
10. Az elmúlt hónap során milyen gyakran érezte úgy, hogy a helyzet magaslatán áll? ¹⁰	0	1	2	3	4
11. Az elmúlt hónap során milyen gyakran dühítették fel olyan dolgok, amelyeket nem tudott befolyásolni? ¹⁰	0	1	2	3	4
12. Az elmúlt hónap során milyen gyakran kapta magát azon, hogy az elvégzendő feladatain gondolkodik?	0	1	2	3	4

	Soha	Szinte soha	Néha	Elég gyakran	Nagyon gyakran
13. Az elmúlt hónap során milyen gyakran tudta kézben tartani az időbeosztását?	0	1	2	3	4
14. Az elmúlt hónap során milyen gyakran érezte úgy, hogy a nehézségek úgy felhalmozódtak, hogy már nem tud úrrá lenni rajtuk? ^{10, 4}	0	1	2	3	4

(Megjegyzések: a tételek végén, a felső indexben szereplő szám jelzi, hogy az adott item szerepel-e a 10, illetve 4 tételes változatban. Fordított tételek: 4,5,6,7,9,10,13.)