

Evidence of the validity of the Multidimensional Scale of Perceived Social Support (MSPSS) in university students

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Abstract *Social support refers to the social resources that a person perceives to be available and has been strongly associated with physical and mental health outcomes. The present study aimed to evaluate the internal consistency, construct validity, and test-retest reliability of the Perceived Social Support Multidimensional Scale (PSSMS) in university students in the Midwest of Brazil. Exploratory and confirmatory factor analyses were performed with two independent random samples, both consisting of 1,147 students. The test-retest study was carried out with a sample of 347 medical students. Data were collected in two separate moments with a 14-day interval. The solution with the best fit was the three-factor model: family, friends, and significant others. The factor loadings of the scale items ranged between 0.767 and 0.950 and each factor showed high internal consistency (Cronbach's alpha=0.96, 0.97, and 0.97, respectively). The model also attained adequate fit: $\chi^2(d.f.)=380 (49)$, $p<0.0001$; SRMR=0.023; RMSEA=0.077; CFI=0.993; TLI=0.990. Test-retest reliability was moderate (weighted kappa ranging from 0.36 to 0.52). The results suggest that the PSSMS has acceptable psychometric properties for use with university students.*

Key words *Social support, Multidimensional Scale of Perceived Social Support, University students*

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Introduction

Social support can be understood as the perception that social resources are available or actual support provided by family, friends, or peers^{1,2}. It means having someone to turn to in times of need³. Types of social support may be classified as emotional (empathy, love, trust, and generosity)³, instrumental (tangible aid in performing activities)¹, informational (advice, information)⁴, social interaction (personal networks)³, appraisal (information that is useful for self-evaluation)⁴, and cognitive (the influence of learning on individual behavior, help with memory loss and reasoning)^{3,5}.

Social support has been associated with better physical and mental health⁶. High levels of social support act as a protective factor against a range of morbidities, thus contributing to better health outcomes⁶. Having someone you can count on to provide emotional and material support in times of need has been associated with lower levels of anxiety, depression, and somatic disorders and helps people to adapt better to the effects of stressful life events^{6,7}.

Several instruments have been developed to assess social support and its various dimensions^{8,9}, including the Multidimensional Scale of Perceived Social Support (MSPSS). The MSPSS was originally developed with a sample of 275 US university students¹⁰ and later tested on a wider sample including 265 pregnant women, 74 adolescents, and 55 pediatric residents¹¹. The studies confirmed the theoretical formulation of the scale items and the existence of three moderately correlated factors. The MSPSS evaluates emotional support and social interaction from three sources: family, friends, and significant others¹⁰. Other commonly used scales assess other facets of social support such as informational and instrumental support, but without specifying the sources, meaning that the MSPSS is differentiated from other measures. The instrument is also used widely around the world because it is easy to use and has a relatively small number of items (12), making it the ideal measure when time is limited.

Recently, a systematic review of 70 studies with approximately 30,909 participants evaluating the MSPSS translated in 22 languages reported that most studies attained a Cronbach's alpha of at least 0.70 and test-retest correlation ranging between 0.72 and 0.859. The MSPSS has demonstrated internal consistency, test-retest stability, and stable factor structure^{9,11}, which is relatively

consistent across the various countries where the scale has been translated and adapted⁹. However, the large majority of the 70 studies only performed exploratory analysis, with only nine performing confirmatory factor analysis⁹. The scale's psychometric properties have been studied in various groups, including adolescents^{12,13}, adults with chronic diseases^{14,15}, psychiatric patients¹⁶, cancer patients¹⁷, older persons¹⁸, and family caregivers of people with dementia¹⁹.

The MSPSS has been adapted for use in Brazil and evidence of validity was reported by Garbado-Martins *et al.*²⁰ in a study with 831 male and female workers from 25 states, most of whom had post-graduate degrees. Factor analysis confirmed factor structure and resulted in acceptable estimates of internal consistency (Cronbach's alpha: friends, 0.93; family, 0.91; and significant others, 0.90)²⁰. In addition, confirmatory factor analysis showed that the three-factor solution presented good goodness-of-fit indices²⁰.

There is no doubt about the importance of social support for the health and well-being of young university students, a group with high prevalence of stress and psychological distress²¹. When evaluating social support in specific populations, it is important to consider the intrinsic variability of social networks and cultural standards^{2,6}. Studies investigating the validity of the MSPSS are therefore important to ensure the accurate evaluation of specific population groups. Evidence of the validity of the MSPSS in university students can help researchers and practitioners choose the best social support measures for this group. Furthermore, there is currently no evidence for test-retest reliability of the Brazilian version of the instrument. The aim of this study was therefore to obtain evidence of validity based on the structure (exploratory and confirmatory factor analysis), internal consistency (Cronbach's alpha), and test-retest reliability of the MSPSS among university students in the Midwest region of Brazil.

Methods

The study population was taken from a cross-sectional study with 2,295 health students at a university in the Midwest region of Brazil. In 2018 a survey was conducted with all health students studying at the university using a pre-tested standardized questionnaire containing the MSPSS and questions devised to collect information about sociodemographic characteristics, behav-

iors, nutrition, and health. The present study was divided into two stages. The first stage assessed the construct validity and internal consistency of the MSPSS in the respondents of the above survey. The second stage explored MSPSS test-retest reliability in a sample of 347 medical students from the original study population. The data for the second stage were collected in November 2019 in two separate moments with a 14-day interval. The sample sizes used in both stages exceeded the minimum size per instrument question recommended in the literature by at least 10 people²². In both stages, the students were approached in the classroom and completed a self-administered questionnaire read out by a researcher in order to minimize missing answers. After completion, the questionnaire was placed in a sealed box.

As mentioned above, the MSPSS assesses emotional support and social interaction from three sources: friends, family, and significant others. The family support items (3, 4, 8 and 11) assess emotional support, availability of support, and help dealing with problems and making decisions, such as item 3: "My family really tries to help me". The support from friends items (6, 7, 9 and 12) investigate help dealing with adverse situations, sharing joys and sorrows, and talking about problems, as illustrated by item 7: "I can count on my friends when things go wrong". The significant others items (1, 2, 5 and 10) look at the presence of a special person in time of need as a source of comfort, to share joys and sorrows, and care about feelings, as shown by item 1: "There is a special person who is around when I am in need". The questions are answered on a 7-point Likert scale, as follows: very strongly disagree (1); strongly disagree (2); mildly disagree (3); neutral (4); mildly agree (5); strongly agree (6); very strongly agree (7).

The data were double entered using EpiData version 3.1 and checked for typing errors. The analyses were performed using Mplus version 8.4²³. The sample was described using absolute and relative frequencies, means, and standard deviations. Internal consistency was measured using Cronbach's alpha, where values equal to or greater than 0.7 indicate a factor structure with good internal consistency²⁴.

Exploratory factor analysis (EFA) and confirmatory factor analysis (CFA) were performed with two random independent samples of 1,147 individuals (excluding one student who did not answer the scale). EFA was performed using the factor extraction method weighted least squares mean and variance adjusted (WLSMV), input-

ting the variables as categorical variables (PROBIT link) and using Geomin oblique factor rotation, which allows the factors to be correlated among themselves^{23,24}.

Factor structure was confirmed using CFA adopting the same estimation method. The analysis tested solutions with one to four factors to determine which model had the best fit^{24,25}. We opted for an open solution with up to four factors. The fit of the factor structure was measured considering the factor loading of the items, number of items per factor, the model's fit indices²⁵, and the results of the analysis of internal consistency²⁴.

The following fit indicators were used in the EFA and CFA: RV (residual variance)²⁴, chi-squared (χ^2), standardized root mean square residual (SRMR), root mean square error of approximation (RMSEA), comparative fit index (CFI), and the Tucker-Lewis index (TLI)^{24,25}. RV represents the variance not explained by the latent factor, where a value of less than 0.75 is deemed adequate²².

Chi-squared tests difference between the empirical matrix and matrix of the theoretical model. For an acceptable fit, the χ^2 value should accept the null hypothesis (nonsignificant p-value > 0.05)²⁴. RMSEA²⁴ values close to or less than 0.06 indicate good fit. SRMR²⁴ values of close to or less than 0.08 are recommended, where the closer to zero the better the fit of the model. CFI²⁴ and TLI²⁴ values range between 0 and 1, where values greater than 0.90 and 0.95 are deemed acceptable and adequate respectively. Improvement in fit with the inclusion of covariances was determined using the Theta modification index²⁴, added to the CFA only when theoretical plausibility was detected.

The test-retest stability (TR) of each scale item was tested using crude and weighted total percentage agreement and kappa coefficients (κ), using the following kappa reference values: 0, no agreement; 0.1 to 0.20, minimal agreement; 0.21 to 0.40, reasonable agreement; 0.41 to 0.60, moderate agreement; 0.61 to 0.80, substantial agreement; and 0.81 to 1.0, perfect or almost perfect agreement²⁴⁻²⁶.

All participants signed an informed consent form. The study was conducted in accordance with the ethical, legal, and regulatory norms and standards for research involving human subjects set out in National Health Council resolutions 466/2012 and 510/2016. The study protocol was approved by the Universidade do Vale do Rio dos Sinos's and Universidade de Rio Verde's

research ethics committees (certificate No. 97545818.2.0000.5344/reference No. 2.892.764 and certificate No. 97545818.2.3001.5077/reference No. 2.905.704, respectively, and reference numbers 3.649.203 and 3.688.985, respectively for the test-retest study).

Results

The EFA and CFA samples were both made up of 1,147 students (total=2,294). The test-retest study was conducted with a sample of 347 medical students. The students were predominantly white single females aged between 21 and 22 years. Economic class A accounted for 45.2%, 44.1%, and 23.9%, respectively, of the EFA, CFA, and test-retest samples (Table 1).

As expected, the solution with the best fit in the exploratory analysis was the four-factor model. However, this solution was immediately discarded and is not presented here because the fourth factor had only one item (I have a special person who is a real source of comfort to me). The two-factor solution loaded friends and significant others on factor 1 and maintained the original family factor in factor 2. The best solution was therefore deemed to be the three-factor model, which reproduced the factor structure suggested by the literature: significant others (factor 1), family (factor 2), and friends (factor 3). These factors obtained the following Cronbach's alpha values: 0.96, 0.97, and 0.97, respectively.

The factor loadings of the three-factor model ranged between 0.636 and 0.972 and the follow-

Table 1. Demographic and socioeconomic characteristics of the university students.

Variables	EFA sample		CFA sample		TRT sample	
	n	EFA %	n	CFA %	n	%
Sex						
Female	791	69	805	70.2	230	66.3
Male	356	31	342	29.8	117	33.7
Age (years)						
18-20	282	24.6	300	26.2	169	48.7
20-22	379	33	408	35.6	103	29.7
23-24	276	24.1	232	20.2	43	12.4
>24	210	18.3	207	18.1	32	9.2
Skin color						
White	673	58.7	644	56.2	206	59.4
Black/brown	418	36.4	451	39.3	132	38
Other	56	4.9	52	4.5	9	2.6
Marital status						
Partner	138	12.1	129	11.3	30	8.6
Without partner	999	87.9	1,012	88.7	317	91.4
Living situation						
Live alone	361	31.7	394	34.7	144	41.5
Live with family/partner	624	54.8	588	51.8	137	39.5
Live with friends/fellow students	154	13.5	154	13.6	66	19
Economic class*						
Class A	491	45.2	486	44.1	83	23.9
Class B	466	42.9	496	45	193	55.6
Class C, D, E	130	12	121	11	71	20.5

Notes: EFA: exploratory factor analysis; CFA: confirmatory factor analysis; TRT: test-retest; *ABEP: Brazilian Market Research Association.

Source: Authors.

ing fit indices were obtained: χ^2 (d.f.) 660.425(33), $p < 0.0001$; SRMR=0.025; RMSEA=0.130; CFI=0.987, and TLI=0.973 (Table 2). The Theta modification index indicated the inclusion of two correlations that made theoretical sense: item 1 (There is a special person who is around when I am in need) with item 2 (There is a special person with whom I can share my joys and sorrows) and item 5 (I have a special person who is a real source of comfort to me) with item 10 (There is a special person in my life who cares about my feelings). These correlations were

therefore added to the CFA, resulting in a better fit to the data.

In the confirmatory factor analysis (CFA), the factor loadings of the items of the three-factor solution ranged between 0.76 and 0.95 and the model obtained the following fit indices: χ^2 (d.f.)=380.006 (49), $p < 0.0001$; SRMR=0.023; RMSEA=0.077; CFI=0.993; TLI=0.990 (Figure 1).

With regard to test-retest stability, the crude and weighted kappa coefficient values ranged between 0.26 and 0.39 and 0.36 and 0.52, re-

Table 2. Results of the exploratory factor analysis using Geomin rotation for a solution with one, two, and three factors and scale fit indices in Brazilian university students (n=1,130).

Questions	RV	One factor EFA		Two factor EFA		Three factor EFA			
		F1	RV	F1	F2	RV	F1	F2	F3
1-There is a special person who is around when I am in need.	0.348	0.807*	0.301	0.176*	0.728*	0.211	0.889*	0.000	0.040
2-There is a special person with whom I can share my joys and sorrows.	0.284	0.846*	0.235	0.203*	0.748*	0.084	0.956*	-0.007	0.007
3- My family really tries to help me.	0.193	0.898*	0.126	0.939*	-0.008*	0.123	0.016	0.932*	-0.006*
4-I get the emotional help and support I need from my family.	0.137	0.929*	0.067	0.979*	-0.025	0.066	0.015	0.972*	-0.024*
5-I have a special person who is a real source of comfort to me.	0.396	0.777*	0.331	0.446*	0.486*	0.265	0.639*	0.352*	-0.020
6-My friends really try to help me.	0.217	0.885*	0.173	0.056*	0.878*	0.150	0.005	0.072*	0.883*
7-I can count on my friends when things go wrong.	0.178	0.907*	0.138	-0.005	0.931*	0.120	-0.018	0.014	0.943*
8-I can talk about my problems with my family.	0.357	0.802*	0.242	0.839*	0.056*	0.231	-0.041	0.838*	0.101*
9-I have friends with whom I can share my joys and sorrows.	0.176	0.908*	0.137	-0.014	0.937*	0.123	0.043	-0.011	0.911*
10-There is a special person in my life who cares about my feelings.	0.374	0.791*	0.306	0.442*	0.508*	0.240	0.636*	0.343*	0.013
11-My family is willing to help me make decisions.	0.255	0.863*	0.158	0.895*	0.041	0.153	-0.013	0.887*	0.045
12-I can talk about my problems with my friends.	0.201	0.894*	0.156	-0.018	0.928*	0.141	0.024	-0.013	0.917*
<i>Eigenvalue</i>		7.961		7.961	1.617		7.961	1.617	0.890
Cronbach's alfa (α)		0.988		0.981	0.967		0.960	0.967	0.967
χ^2 (d.f.), p-value		3225 (54).		1999 (43).			660 (33).		
		p<0.001		p<0.001			p<0.001		
SRMR		0.179		0.074			0.025		
RMSEA		0.228		0.201			0.130		
CFI		0.933		0.958			0.987		
TLI		0.918		0.936			0.973		

Notes: * $p < 0.05$; One factor: F1: friends, family, and significant others. Two factors: F1: friends and significant others; F2: family. Three factors: F1: significant others; F2: family; F3: friends. RV: Residual variance. Indices: χ^2 : (Chi-squared); (α): Cronbach's alfa; SRMR (standardized root mean square residual); RMSEA (root mean square error of approximation). CFI (comparative fit index). TLI (Tucker-Lewis index).

Source: Authors.

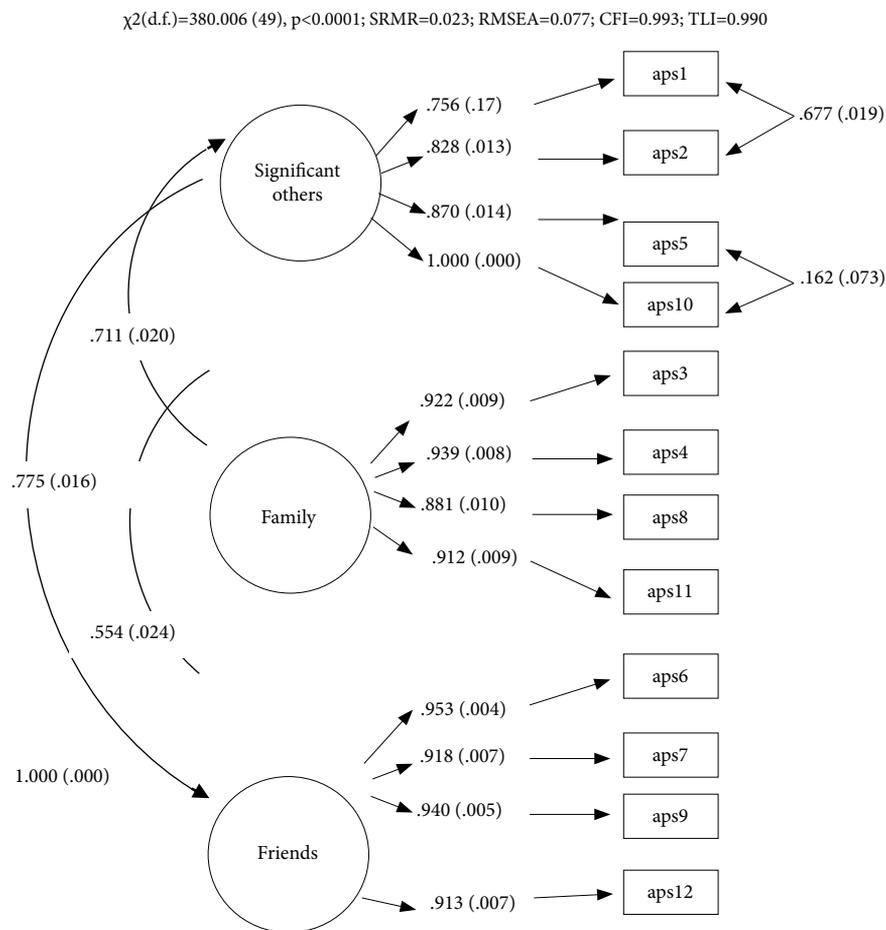


Figure 1. Confirmatory factor analysis of the three-factor solution for the Multidimensional Scale of Perceived Social Support (MSPSS) in Brazilian university students ($n=1,143$).

Notes: ss (MSPSS items as shown in Tables 2 and 3); Significant others (1, 2, 5, 10); Family (3, 4, 8, 11); Friends (6, 7, 9, 12).

Source: Authors.

spectively, while crude and weighted percentage agreement ranged between 48.7% and 62.5% and 83.5 and 89.7%, respectively (Table 3).

Discussion

The aim of this study was to assess the internal consistency, construct validity, and test-retest reliability of the Multidimensional Scale of Perceived Social Support (MSPSS) in Brazilian

university students. Our findings confirm the three-factor structure (family, friends, and significant others) of the original version of the MSPSS^{10,11}. These results are consistent with the literature on this population²⁷⁻³³. The findings also demonstrate that the MSPSS and factors have high internal consistency and that the factor solution provides a good fit for study population, obtaining higher values than those reported for the original version of the scale¹¹ and a previous study with 237 medical students³³.

Table 3. Crude and weighted kappa coefficient values and percentage agreement of the test-retest of the Multidimensional Scale of Perceived Social Support (MSPSS) in Brazilian university students (n=347).

Scale item	% Agreement	% Weighted Agreement	Kappa	Weighted Kappa
1-There is a special person who is around when I am in need.	48.70	83.05	0.27	0.37
2-There is a special person with whom I can share my joys and sorrows.	51.30	85.59	0.27	0.44
3-My family really tries to help me.	66.57	89.72	0.33	0.42
4-I get the emotional help and support I need from my family.	60.23	88.04	0.35	0.45
5-I have a special person who is a real source of comfort to me.	58.50	86.07	0.29	0.36
6-My friends really try to help me.	51.59	86.94	0.35	0.49
7-I can count on my friends when things go wrong.	51.87	87.18	0.35	0.49
8-I can talk about my problems with my family.	56.77	86.50	0.38	0.50
9-I have friends with whom I can share my joys and sorrows.	50.72	86.79	0.31	0.47
10-There is a special person in my life who cares about my feelings.	55.33	86.89	0.26	0.41
11-My family is willing to help me make decisions.	62.54	88.42	0.39	0.48
12-I can talk about my problems with my friends.	52.16	87.27	0.35	0.52

Source: Authors.

The CFA results, except for the significant χ^2 value, which is strongly influenced by sample size, suggest that the model has good fit. The other indicators demonstrated adequate values for the three-factor model in comparison to the one- and two-factor models and considering the values obtained by the study that evaluated the original version of the scale¹⁴ and other studies with university students^{27-29,33,34}. The RMSEA was acceptable despite being slightly higher than the desired value. A previous study with 549 university students reported similar results, supporting the three-factor model and showing that the MSPSS had high internal consistency and acceptable RMSEA³⁰.

In addition, factor loadings in the CFA were high (above 0.78) and the factors reproduced the results of the original version of the scale¹¹, which is consistent with previous studies^{9,28}. In our study, we found correlations with lower factor loadings in items 1, 2, 5, 10, which belong to the “significant others” factor. This may be explained by the fact that university students may perceive family and friends to be a more acceptable source of support than significant others, which has been shown by other studies^{32,34}. Based on

the results of the theoretical plausibility test, we therefore introduced correlations between items 1 and 2 and items 5 and 10, improving the fit of the confirmatory model.

With regard to test-retest reliability, the MSPSS showed reasonable stability over time for a 14-day interval and moderate agreement for scale items with their respective factors, as reported by Portugal³¹ for the friends factor. In addition, the results of a study assessing the validity of a Russian version of the MSPSS with 1,018 adults³⁵ indicated acceptable test-retest reliability. It is possible that changes in perceived social support occurred during the time interval given that this construct is strongly mediated by other psychosocial aspects⁶, which may explain the insubstantial Kappa values found in the present study. In addition, it is important to consider measure errors that are intrinsic to the construct assessed by the scale in consecutive applications.

Finally, it can be concluded that the MSPSS has acceptable psychometric properties, adequate internal consistency and construct validity, and moderated test-retest reliability, suggesting that the instrument has good fit for use with university students. As proposed by Zimmet,

the three-factor solution showed the best fit. The availability of MSPSS and evidence for validity can help in investigating mechanisms and causal relationships between social support and physical and mental health among university students^{6,12}.

Although our findings support the use of the Brazilian version of the scale, certain limitations need to be considered. The study sample comprised health students and is therefore not representative of students doing other courses or

young people in general. Studies evaluating evidence for the validity of the MSPSS with clinical samples have yet to be conducted and would be an interesting direction for future research. Future studies with other population groups, using robust methods to assess measurement invariance of the MSPSS in minority groups for example, could help make the measure more accurate and enable comparison between results obtained with different populations.

Collaborations

All authors participated directly in study conception and planning and in drafting the article. However, the following authors' contributions should be highlighted: AVM Brugnoli contributed to study conception and data collection, tabulation and analysis. RCD Silva contributed to study conception and statistical analysis. TR Gonçalves contributed to study conception, data analysis, and to drafting and revising the final version of the article. MP Pattussi provided supervision and contributed to defining the study methodology, data analysis, and drafting the final version of the article.

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