PSYCHOMETRIC PROPERTIES OF THE MEDICAL OUTCOMES STUDY- SOCIAL SUPPORT SURVEY (MOS-SSS-A) AMONG ADOLESCENTS IN PUERTO RICO

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Abstract

This study aims to examine the psychometric properties of the Medical Outcomes Study-Social Support Survey (MOS-SSS-A) in a sample of adolescents in Puerto Rico. The sample consisted of secondary data of 787 students, ranging in age from 10 to 18, who attended public schools located in the southeast and northeast of Puerto Rico. We conducted a confirmatory factor analysis to test the factorial structure of the MOS-SSS-A. Additionally, correlations among perceived social support, depression, and anxiety were evaluated as evidence of discriminant validity. Results indicated a better fit when using the four-factor original model. Perceived social support scores were negatively correlated with depression and anxiety scores, which evidence discriminant validity. In conclusion, the MOS-SSS modified for adolescents (MOS-SSS-A) could be a valuable instrument for evaluating its role in reducing or preventing psychopathologies and offering early interventions for high-risk populations such as adolescents from minority groups.
KEY WORDS: *MOS-SSS, perceived social support, psychometrics, adolescents, Hispanic.*

Resumen

Este estudio tiene como objetivo examinar las propiedades psicométricas de la "Escala de apoyo social del Estudio de resultados médicos" (MOS-SSS-A) en una muestra de adolescentes en Puerto Rico. La muestra consistió de datos secundarios de 787 estudiantes, de entre 10 y 18 años de edad, que asistían a escuelas públicas ubicadas en el sureste y noreste de Puerto Rico. Realizamos un análisis factorial confirmatorio para probar la estructura factorial de la MOS-SSS-A. Además, se evaluaron las correlaciones entre el apoyo social percibido, la depresión y la ansiedad como evidencia de validez divergente. Los resultados indicaron un mejor ajuste cuando se utilizó el modelo original de cuatro factores. Las puntuaciones de

apoyo social percibido se correlacionaron negativamente con las puntuaciones de depresión y ansiedad, que evidencian validez divergente. En conclusión, la MOS-SSS modificado para adolescentes (MOS-SSS-A) podría resultar un instrumento útil para la evaluación de su papel en la reducción o la prevención de psicopatologías, así como en el ofrecimiento de intervenciones tempranas para poblaciones en alto riesgo como los adolescentes de grupos minoritarios.

PALABRAS CLAVE: *MOS-SSS, apoyo social percibido, psicometría, adolescentes, hispanos.*

Introduction

The prevalence of mental health conditions among adolescents in Puerto Rico is an increasing concern. It is estimated that at least 150,000 children under 18 years of age have mental health disorders in Puerto Rico, of which 18.14% were diagnosed with a mental health condition in 2016. Of these, 4% showed internalized problems associated with anxiety and depression (Rodríguez-Pares et al., 2016). Despite this high prevalence, research indicates that perceived social support is an essential protective factor to mitigate symptoms of mental health conditions such as depression and anxiety (Alegria et al., 2019; Brinker & Cheruvu, 2017; Canino et al., 2019; Dour et al., 2014; González-Retuerto & Estévez-Gutiérrez, 2017; Larrucea-Iruretagoyena & Orue, 2021), and suicidal ideation (Brausch & Decker, 2014; Fredrick et al., 2018). Furthermore, it has been found that social support is positively related to well-being (Rodríguez et al., 2015; World Health Organization [WHO], 2019). Assessing social support among adolescents seems crucial to understand its role in reducing mental health conditions and promoting their well-being.

Perceived social support is defined as the emotional help that a person perceives to obtain from those around him; it is of utmost importance for development during adolescence (Brausch & Decker, 2014). Due to the complexity of the construct, perceived social support has been conceptualized in many ways. For this study, we will focus on the conceptualization of Sherbourne and Stewart (1991), which identifies the structural and functional types of perceived social support. Structural support refers to the size of the support group that the person has. Functional support is the most crucial aspect since it includes the different functions that the support group has regarding the person's life. The functions are divided into four dimensions: emotional support (empathy, orientation, advice), instrumental support (behavior or material support), social interaction (availability to carry out activities together), and affective support (expression of love and affection) (Londoño-Arredondo et al., 2012; Sherbourne & Stewart, 1991).

Each of these functions plays an essential role in the life of adolescents. For example, Mishna et al. (2016) found that when adolescents have robust social support systems, they have a better perception of themselves and are likely to experience lower victimization levels by bullying. Furthermore, a meta-analysis conducted to evaluate the relationship between well-being and perceived social support in children and adolescents found an association where perceived social support was most strongly associated with well-being compared with other

measures (Chu et al., 2010). In addition, Rueger et al. (2010) identified significant positive correlations between perceived social support and self-esteem; and negative relationships between perceived social support and symptoms of depression and negative attitudes towards school. Similarly, Xin et al. (2019) found that peer trust and perceived social support played a mediating role between self-esteem and social adjustment. Finally, Peter et al. (2016), using the social support scale of the Medical Outcomes Study, found that pregnant adolescents suffering from anxiety disorders had a lower perception of social support when compared with adolescents who did not have any disorder.

One of the instruments used to examine perceived social support is the *Medical Outcomes Study- Social Support Survey* (MOS-SSS; Sherbourne & Stewart, 1991). Even though other instruments that measure the construct exists, the MOS-SSS has the advantage of evaluating two types of social support: structural and functional support. The structural support asks about the size of the social network. Meanwhile, functional support examines four dimensions: emotional support, instrumental support, social interaction, and affective support. The MOS-SSS is a versatile self-report instrument that could be used in different scenarios.

This instrument was initially developed in English to measure the perceived social support of adult patients with health conditions (Sherbourne & Stewart, 1991). Therefore, more commonly, studies have been conducted to evaluate psychometric properties among populations with chronic health conditions such as HIV (Yu et al., 2015), cardiovascular diseases (Wang et al., 2013), and cancer (Costa et al., 2007). In all these studies, the instrument has shown acceptable internal consistency and reliability values ranging from .71 to .97. Furthermore, significant negative correlations between social support and the anxiety and depression subscales have been found among the mentioned studies. These implied that as people perceive more social support, the reported symptoms of anxiety and depression are lower. Therefore, it is concluded that the instrument shows reliable and consistent measures for all these populations.

On the other hand, studies have been conducted to evaluate the instrument's psychometric properties with non-clinical populations. For example, Londoño-Arredondo et al. (2012) examined the psychometric properties for non-clinical populations in Colombia, where the sample consisted of 179 adults. The internal consistency using a Cronbach's alpha was between .92 and .74. In the study, the validity of the factorial structure was evaluated for four dimensions (informational-emotional support, instrumental support, social interaction, and affective support) and three dimensions (affective support was excluded). Both obtained significant values that validated the instrument's structure; however, the three-dimensional factor structure obtained a better statistical value. The study concluded that the MOS-SSS in the non-clinical populations is a valid and reliable instrument to evaluate perceived social support in the Colombian population.

Another validation of the MOS-SSS was developed in Italy by Giangrasso and Casale (2014), where the psychometric properties were evaluated in 485 undergraduate university students. In the study, the four-dimension model's consistency (like the previous study) and a two-dimension model (emotional factor and tangible factor) were evaluated; the second did not obtain good validity. The

four-dimensional model results indicated good internal consistency, with a Cronbach's alpha value between .85 and .94. Furthermore, the instrument's stability was examined and confirmed by re-administration to 225 students after ten months. Significant positive correlations were found between perceived social support and well-being and negative correlations with depression symptoms. The study suggests that the MOS-SSS has good psychometric properties to measure perceived social support in non-clinical populations. A similar study was conducted in Puerto Rico (Rodríguez et al., 2015), where the main objective was to evaluate the relationship between the dimensions of psychological well-being and social support among undergraduate university students. The MOS-SSS obtained a total internal consistency of .84. Variability was found in the alpha values for the dimensions: emotional support (α= .941), positive social interaction (α= .449), instrumental support (α= .449) and affective support (α= .171). The results showed that the MOS-SSS exhibits adequate consistency for use in three of its four dimensions. Furthermore, the results reflected positive correlations between psychological well-being and perceived social support.

In the population of children and adolescents, we found a validation and adaptation of the MOS-SSS developed by Rodríguez (2011) in Argentina. The sample consisted of 593 participants between the ages of nine and thirteen. In the study, the questionnaire was adapted by changing the language to one more appropriate for children and adolescents and reducing the Likert-type scale from five points to three (yes, sometimes, and no). Even though the study does not justify reducing the number of response options, other studies have indicated that reducing the options when doing research with children can be beneficial (Mellor & Moore, 2014). The results reflect acceptable psychometric properties. However, it was understood that children do not differentiate between different types of social support since they see it as a general concept. Internal consistency was a Cronbach's alpha coefficient of .84 for the complete instrument. It is concluded that it is a valid instrument to measure the perceived social support in children and adolescents from Argentina.

Although the Medical Outcomes Study-Social Support Survey has shown adequate reliability and validity rates both in clinical and non-clinical populations (Costa et al., 2007; Giangrasso & Casale, 2014; Londoño-Arredondo et al., 2012; Rodríguez, 2011; Wang et al., 2013; Yu et al., 2015) and with mental health conditions (Peter et al., 2016; Rodríguez et al., 2015), only one study which examined the instrument among adolescents has been found. It is noteworthy that the instrument has not been widely studied in the population of children and adolescents, even less in the Spanish-speaking population. In Puerto Rico, the instrument has been used for the adult population; however, no studies were found on perceived social support and its use among adolescents. This study aims to examine the Medical Outcomes Study- Social Support Survey (MOS-SSS-A) psychometric properties on a sample of adolescents in Puerto Rico.

Method

Participants

The sample in the database consisted of 802 students from sixth through twelfth-grade students that attended public schools located in the southeast and northeast part of Puerto Rico. However, fifteen participants were excluded for not answering more than half of the items (9 or more) on the MOS-SSS-A. The final sample comprises 787 participants (Table 1) who assisted schools in low-income communities. Even though we did not collect their socioeconomic data, the Puerto Rico Department of Education reports that 76.7% of students enrolled in the Puerto Rico public school system are economically disadvantaged (Department of Education of Puerto Rico, 2020). The average age of the participants is 14.18 years (SD= 2.17), with a minimum age of 10 and a maximum of 18.

Table 1
Socio-demographic characteristics of participants

Variable	n	%
Gender		
Female	412	52.4
Male	356	45.2
No response	19	2.4
Grade		
6th grade	115	14.6
7th grade	85	10.8
8th grade	105	13.3
9th grade	86	10.9
10th grade	114	14.5
11th grade	127	16.1
12th grade	144	18.3
No response	11	1.4
Age (years)		
10-12	215	27.3
13-15	279	35.5
16-18	268	34.1
No response	25	3.2
Anxiety Symptoms		
No symptoms	548	77.6
Mild	107	15.2
Moderate	41	5.8
Severe	10	1.4
Depression Symptoms		
No symptoms	622	88.4
Major depression symptoms	72	10.2
Severe major depression symptoms	10	1.3

Instruments

a) *Medical Outcomes Study- Social Support Survey for Adolescents* (MOS-SSS-A; Sherbourne & Stewart, 1991), Spanish version by Rodríguez (2011). The MOS-SSS was developed to measure perceived social support in patients with chronic health conditions. The MOS-SSS is an instrument that consists of 20 items used to measure two types of social support: structural support and functional support. The first question evaluates the approximate number of close friends and family that the individual recognizes (e.g., *¿Cuántos mejores amigos tienes?* [How many best friends do you have?]). It is used to measure structural social support (size of the social network). The following 19 statements measure the functional support using a Likert scale, being: 1= *never*, 2= *sometimes*, and 3= *always*. The functional support is divided into four dimensions: emotional support (e.g., *Tengo a alguien para conversar cuando necesito hablar* [e.g., I have someone to talk to when I need it]), instrumental support (e.g., *Tengo a alguien que me ayuda en las tareas* [e.g., I have someone who helps me with homework]), social interaction (e.g., *Tengo a alguien con quien puedo hacer cosas para olvidarme de los problemas* [e.g., I have someone with whom I can do things to forget about problems]), and affective support (e.g., *Tengo a alguien que quiero y siento que me quiere* [e.g., I have someone I love and I feel that they love me]). The global social support index is obtained by adding the 19 items: the higher the score, the higher the perceived social support level.

b) *Patient Health Questionnaire-8 modified for Adolescents* (PHQ-8-A; Kroenke & Spitzer, 2002), translation to Spanish by the MAPI Research Institute (Pfizer, n.d.). The PHQ-8-A has eight items used to detect and monitor symptoms of depression among adolescents. Similar to the adult version (Kroenke et al., 2001), a score of zero means "never" experienced symptoms, two refers to "more than half the days in the week", and three implies a high frequency or "almost every day". The lowest total score is zero, and the highest is 24, where a score greater than ten is considered symptomatic of major depression and a score greater than 20 is considered symptomatic of severe major depression. A study carried out in Puerto Rico to evaluate the psychometric properties of the translated and adapted PHQ-9-A indicates a better fit by eliminating the ninth element of the scale that evaluates suicidal ideation, referring to PHQ-8 (López-Torres et al., 2019). In the same study, a Cronbach's alpha of the PHQ-8-A was obtained above the recommended value of .70 (α_{female}= .87; α_{male}= .80) and a reliability higher than the recommended .70 (α_{female}= .86; α_{male}= .84). This study reveals good psychometric properties to evaluate depression symptoms in young residents of Puerto Rico.

c) *Generalized Anxiety Disorder 7-item - Adolescent Version* (GAD-7-A; Spitzer, Kroenke et al., 2006), Spanish version by García-Campayo et al. (2010). The GAD-7 was developed as a self-administered 7-item instrument used to detect and measure anxiety symptoms. Each item is scored on a 0 to 3-point Likert scale ("not at all" to "nearly every day"). The minimum total score is zero, and the maximum is 21. A score between 5 to 9 represents mild anxiety symptoms, between 10 to 14 for moderate, and between 15 to 21 for severe. The Spanish

version of the instrument has presented optimal validity and reliability in Hispanic populations, resulting in a Cronbach α of .94 (Mills et al., 2014). The results of a study carried out in Puerto Rico to evaluate the psychometric properties of the GAD-7-A translated and adapted into Spanish present optimal psychometric properties in terms of construct, convergent validity, and internal consistency, being a useful instrument for evaluating anxiety (Pérez-Pedrogo et al., 2022).

Procedure

For this study, we used secondary data from a service program titled "Wellness Approaches in Schools: Enhancing Students Mental Health thru Evidence-Based Programs". The primary project collected data from August to October 2019 as an initial assessment to identify participants for a mental health program at the school. The students whose caregivers provided consent were invited to assent and voluntarily completed the questionnaires. The recruiters completed training that addressed human subjects' protection, informed consent protocols, interviewing protocols, and data safety. The program evaluator coordinator assisted and supervised the recruiters.

The questionnaire was divided into two parts. The first included students' sociodemographic and academic information (i.e., gender, age, academic grade) and the social support scale. The second part was completed a week later and included anxiety and depression scales. This time delay between measures reduces common method bias in self-reported designs (Podsakoff et al., 2012) and minimized the length of the questionnaire completed each visit, reducing respondent's fatigue and augmenting the response rate (Rolstad et al., 2011). During the data collection, psychologists were available to manage possible adverse events.

We obtained permission to use the principal investigators' data, which provided data sets with de-identified information of the participants. The proposal was reviewed and approved by the Institutional Review Board for Research Ethics (IRB) of one of the author's main institutions. Raw data of the MOS-SSS-A and data of anxiety and depression measures were analyzed to examine the construct and discriminant validity of the MOS-SSS-A.

Data analysis

All analyses were conducted with SPSS v. 26 and AMOS v. 26. Using SPSS, we examined the descriptive statistic values, the internal consistency, and discriminant validity. To examine the internal consistency of the total MOS-SSS-A and the four dimensions, we used Cronbach's alpha. An index between .70 and .90 in the estimate of internal reliability is considered acceptable for the initial phases of research (Hair et al., 2006; Nunnally & Bernstein, 1994). However, other authors suggest that between .65 and .70 is considered minimally acceptable; between .70 and .80 is respectable, and between .80 and .90 is very good (DeVellis, 2016).

To examine the MOS-SSS-A factor structure, we performed confirmatory factor analysis (CFA) through the maximum likelihood estimation approach using AMOS v.26. The following absolute and relative goodness-of-fit indices were considered to evaluate model fit. Considering the non-normality of the data (Doornik-Hansen test= $\chi^2_{(38)}$= 9274.94, $p<$ .001; Mardia Skewness= 116.87, $\chi^2_{(1330)}$= 15394.98, $p<$ .001), we calculated the Satorra-Bentler (Satorra & Bentler, 1994) scaled chi-square (χ^2_{S-B}); comparative fit index (CFI$_{S-B}$), the Tucker-Lewis index (TLI$_{S-B}$), the root mean square error of approximation (RMSEA$_{S-B}$), and the standardized root mean square residual (SRMR). We considered indicators of good fit to be values under .08 for RMSEA and .05 for SRMR, and above .90 for CFI and TLI (Hu & Bentler, 1999). To evaluate the magnitude of the change in the fit index, we followed the recommendations of Cheung and Rensvold (2002), who suggested that an absolute difference in CFI (i.e., ΔCFI) of less than 0.01 would indicate that the models are equivalent in terms of fit. Two competitive models were analyzed: model 1 (M1), where the 19 items were loaded to a single factor, and model 2 (M2), examined the four-factors model. Model 2 was re-specified based on modification indices resulting in a model 2-modified (M2-modified).

Results

Descriptive analysis

The first item of the MOS-SSS determines the amount of structural social support the participants consider, using two categories: family and friends. The adolescents evaluated the number of friends mentioning the number of friends they perceived to have. On the other hand, the family was evaluated using the following options: mom, dad, sister, brother, grandmother, grandfather, aunt, uncle, female-cousin, male-cousin, and others. Also, they had the option to indicate the other social support perceived.

The results indicate that the mean of total structural social support was 9.54 (*SD*= 10.54), and the mode was 7. The number of family mentioned by the adolescents ranged from zero (*n*= 25, 3.2%) to ten (*n*= 22, 2.8%), with the mode being 4 and the mean 4 (*SD*= 2.4). Most of the participants mentioned the social support of the mother (*n*= 673, 85.5%), followed by the grandmother (*n*= 465, 59.1%) and the father (*n*= 431, 54.8%). The number of friends ranged from zero (*n*= 39, 5.3%) to 198 (*n*= 1, .1%), with the mode being 2 and the mean 4.86 (*SD*= 10.14).

Furthermore, descriptive analysis performed by gender indicates similar values on the total MOS-SSS-A and its four dimensions, with slight differences showing more social support perceived by males. In terms of age, the group that perceived less social support was between 16 to 18 years (Table 2). On the clinical variables (Table 3), females presented more depression and anxiety symptoms. Also, the age group that presented more anxiety and depression symptoms was between 16 to 18 years.

Table 2
Perceived social support by gender and age

Variable	Gender				Age (years)					
	Female		Male		10-12		13-15		16-18	
	M	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*
MOS-SSS-A (Total)	32.5	6.5	33.3	6.5	33.8	6.1	33.4	6.0	31.6	7.0
Emotional Dimension	13.1	3.5	13.7	3.5	13.7	3.4	13.7	3.3	12.8	3.7
Affective Dimension	5.3	1.2	5.5	1.1	5.6	0.95	5.5	1.1	5.2	1.3
Interaction Dimension	7.0	1.4	7.0	1.5	7.0	1.5	7.1	1.3	6.9	1.5
Instrumental Dimension	7.0	1.3	7.2	1.3	7.4	1.1	7.1	1.2	6.8	1.4

Table 3
Clinical variables characteristics by gender and age

Variable	Gender				Age (years)					
	Female		Male		10-12		13-15		16-18	
	n	*%*	*n*	*%*	*n*	*%*	*n*	*%*	*n*	*%*
Depression symptoms										
No symptoms	312	83.9	296	93.1	180	92.3	221	89.5	199	83.6
MD symptoms	53	14.2	19	6.0	14	7.2	22	8.9	35	14.7
Severe MD symptoms	7	1.9	3	0.9	1	0.5	4	1.6	4	1.7
Anxiety symptoms										
No symptoms	275	73.7	261	82.1	168	85.7	192	77.4	166	69.7
Mild	63	16.9	42	13.2	16	8.2	39	15.7	51	21.4
Moderate	27	7.2	13	4.1	11	5.6	14	5.6	15	6.3
Severe	8	2.2	2	0.6	1	0.5	3	1.3	6	2.6

Note: MD= Major depression.

Construct validity: Confirmatory factor analysis

Factor structure of the MOS-SSS-A was tested with confirmatory factor analysis (see Table 4). Based on previous research on the validity of the MOS-SSS-A, we tested two models: one assumes that all perceived social support items load in a single factor (M1), and the other proposes four related factors (M2). The results indicate that the one-factor structure did not fit the data adequately: $\chi^2(152)=$ 668.28, RMSEA= .066, SRMR= .061, CFI= .87, TLI= .85. However, the four-factor structure (see Figure 1) fit the data adequately: $\chi^2(146)=$ 491.98, RMSEA= .055, SRMR= .053, CFI= .913, TLI= .89. To decide whether the model needed re-specification, we inspected the modification indexes, which indicated that allowing the errors for two items (item 2 and item 5) from the instrumental dimension to correlate could increase the model fit, $\chi^2(145)=$ 410.18, RMSEA= .048, SRMR= .048, CFI= .93, TLI= .92. The covariation is conceptually explained given the common

theme related to physical health aspects in both items. This revised model (see M2-modified in 4) presents the best fit to the data. We retained this MOS-SSS modified for adolescents (MOS-SSS-A) as the best model.
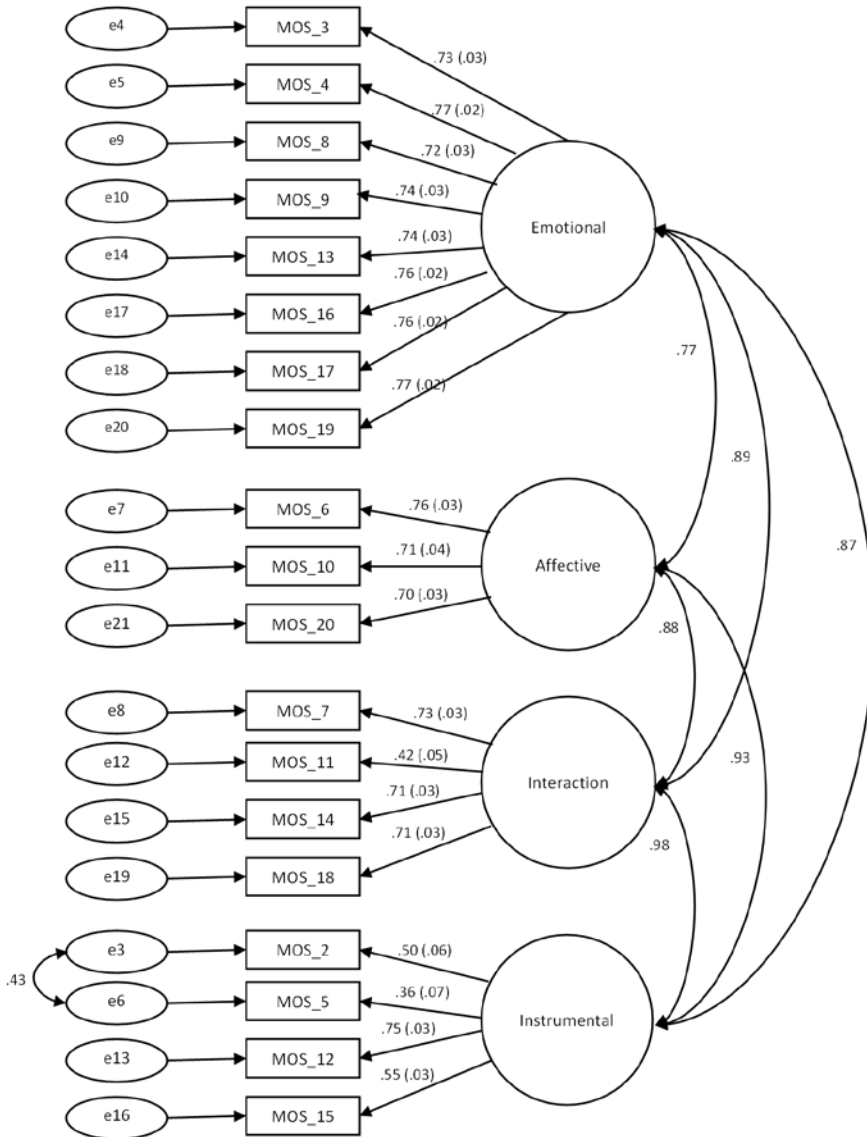
Figure 1
M2-modified

Note: Standardized factor loads of items and standard errors (in parenthesis).

Table 4
Confirmatory factor analysis model fit of the MOS-SSS-A

Model	$\chi^2_{\text{S-B}}$	*df*	$RMSEA_{\text{S-B}}$	SRMR	$CFI_{\text{S-B}}$	$TLI_{\text{S-B}}$	$\Delta\chi^2$ (Δdf)
M1 (one dimension)	668.28	152	.066	.061	.87	.85	
M2 (4 dimensions)	491.98	146	.055	.053	.913	.89	176.3 (6)**
M2-modified (error covariance item 2 & 5)	410.18	145	.048	.048	.93	.92	81.8 (1)**

Notes: RMSEA= root mean square error of approximation; SRMR= standardized root mean residual; CFI= comparative fit index; TLI= Tucker Lewis index. **$p< .01$.

Discriminant validity and internal consistency

Table 5 shows descriptive statistics, correlations, and Cronbach's alpha. The Cronbach's alpha coefficients indicated that the MOS-SSS-A total instrument has a very high internal consistency, $\alpha= .93$. The three of the four dimensions have moderately high internal consistency reliability. For the Emotional dimension, $\alpha= .91$; for the Affective dimension, $\alpha= .76$; for the Interaction dimension, $\alpha= .73$; and for the Instrumental dimension, $\alpha= .66$. These findings support the reliability of the instrument.

As expected, MOS-SSS-A scores were negatively correlated with depression ($r= -.262$, $p< .01$) and anxiety ($r= -.242$, $p< .01$) scores. These findings provide evidence of the discriminant validity of the MOS-SSS-A.

Table 5
Mean, standard deviation, correlation, and reliability estimates

Measure	*n*	*M*	*SD*	α	1	2	3	4	5	6
1. MOS-SSS-A	787	32.80	6.59	.933	--					
2. Emotional	787	13.29	3.52	.909	.943**	--				
3. Affective	787	5.38	1.17	.762	.800**	.648**	--			
4. Interaction	787	6.95	1.47	.730	.876**	.750**	.673**	--		
5. Instrumental	787	7.06	1.29	.656	.805**	.642**	.640**	.674**	--	
6. PHQ-8-A	704	3.59	4.79	.877	-.262**	-.233**	-.219**	-.209**	-.259**	--
7. GAD-7-A	706	2.71	3.71	.848	-.242**	-.208**	-.198**	-.204**	-.249**	.813**

Notes: MOS-SSS-A= Medical Outcomes Study- Social Support Survey; PHQ-8-A= Patient Health Questionnaire-8 modified for Adolescents; GAD-7-A= Generalized Anxiety Disorder 7-item - Adolescent Version; α= Cronbach's alpha. **$p< .01$ (two-tailed).

Discussion

The purpose of this study was to investigate the psychometric properties of the Medical Outcomes Study- Social Support Survey with a sample of adolescents living in Puerto Rico. Perceived social support is a protective factor for various mental health conditions, such as anxiety, depression, and suicidal ideation. An accessible and validated instrument can encourage its use in various settings and offer valuable information when planning early intervention services. Although the Medical

Outcomes Study-Social Support Survey has shown good psychometric properties in clinical and non-clinical populations and mental health conditions, we found only one study that examined the instrument among adolescents. It is noteworthy to mention that no validated instruments have been found to measure perceived social support among adolescents living in Puerto Rico. Validation of the MOS-SSS adapted for adolescents could be used as a screening tool to examine and understand the role of perceived social support in reducing mental health conditions and promoting well-being among this population.

The present study results indicate that the Medical Outcomes Study- Social Support Survey with a sample of adolescents living in Puerto Rico (MOS-SSS-A) is a valid and reliable instrument to measure perceived social. Interestingly, the one-factor model did not fit the data adequately. Previous research results suggested a better fit for the one-factor model; the author hypothesizes that a possible explanation was that children and adolescents could not differentiate between the dimensions of social support; however, it was recommended to explore using more participants in the study (Rodríguez, 2011). Contrary to these findings, our results validate that the MOS-SSS-A proved a better fit with a four-factor model consisting of: (1) emotional support, (2) instrumental support, (3) social interaction, and (4) affective support. This factor structure coincides with the original instrument developed for adults and is similar to other studies' findings (Giangrasso & Casale, 2014; Sherbourne & Stewart, 1991; Wang et al., 2013).

After retaining the four-factor MOS-SSS-A modified as the best model, we evaluated the discriminant validity of the instrument. As expected, MOS-SSS-A scores were negatively correlated with depression and anxiety scores (Giangrasso & Casale, 2014; Wang et al., 2013). These findings concur with several studies that present perceived social support as a protective factor for the reduction of symptoms of depression and anxiety (Alegria et al., 2019; Brinker & Cheruvu, 2017; Canino et al., 2019; Dour et al., 2014; González-Retuerto & Estévez-Gutiérrez, 2017).

Another important finding of this study was the number of friends perceived in the item that measures structural social support, ranging from zero to 198. A possible explanation for this is the use of social media, where followers can be perceived as friends for adolescents. The number of social network friends is positively associated with life satisfaction (Oshio et al., 2020). Future research should consider whether adolescents have a different conception of friendship and social media's impact in defining this construct. A literature review indicates that increasing evidence suggests that online communication may be a critical avenue for peer-to-peer support for adolescents (Ito et al., 2020). Online social support appears important when attempting to prevent and reduce loneliness among insecurely attached people (Benoit & DiTommaso, 2020) and enhance subjective life satisfaction (Oshio et al., 2020). It could be interesting to evaluate the impact that can have the use of social media on the different dimensions of perceived social support.

As part of this study's limitations, the sample used was not representative of the general population of adolescents living in Puerto Rico. Although this study's sample consisted of students who attended public schools both in the southeast and northeast area of Puerto Rico, the generalization of the results was limited. We

recommend further researching the psychometric properties of the MOS-SSS and MOS-SSS-A among clinical and non-clinical populations in Puerto Rico. Subsequent studies could evaluate the convergent validity of the MOS-SSS-A with other instruments previously validated in the Spanish-speaking population, like an instrument that evaluates well-being to further expand the validity and reliability of the instrument (Chu et al., 2010; Giangrasso & Casale, 2014; Rodríguez et al., 2015). Furthermore, studies that evaluate the MOS-SSS-A cutoff scores in specific groups such as children, adolescents, and persons who are Latino/a are scarce. Research should be conducted to identify the sensitivity and specificity of the MOS-SSS-A to establish an optimal cutoff score for perceived social support screening among adolescents residing in Puerto Rico and other Latino and Hispanic populations.

Studies that evaluate the MOS-SSS-A among minority groups such as Latinos are limited. The present study provides important new insights into the psychometric properties of the MOS-SSS-A in the adolescent population. We found expected associations with other measurement instruments (PHQ-8 and GAD-7) and good internal consistency. The one-factor model did not fit the data adequately. However, the original four-factor model presented adequate psychometric properties. This instrument is suitable for use in research and can offer valuable information when planning early intervention services. Due to its easy administration and interpretation, the MOS-SSS-A can be used in various contexts such as primary care, school, and community settings.

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