

Validation of the MOS Social Support Survey 6-item (MOS-SSS-6) measure with two large population-based samples of Australian women

Libby Holden · Christina Lee · Richard Hockey ·
Robert S. Ware · Annette J. Dobson

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Abstract

Purpose This study aimed to validate a 6-item 1-factor global measure of social support developed from the Medical Outcomes Study Social Support Survey (MOS-SSS) for use in large epidemiological studies.

Methods Data were obtained from two large population-based samples of participants in the Australian Longitudinal Study on Women's Health. The two cohorts were aged 53–58 and 28–33 years at data collection ($N = 10,616$ and $8,977$, respectively). Items selected for the 6-item 1-factor measure were derived from the factor structure obtained from unpublished work using an earlier wave of data from one of these cohorts. Descriptive statistics, including polychoric correlations, were used to describe the abbreviated scale. Cronbach's alpha was used to assess internal consistency and confirmatory factor analysis to assess scale validity. Concurrent validity was assessed using correlations between the new 6-item version and established 19-item version, and other concurrent variables.

Results In both cohorts, the new 6-item 1-factor measure showed strong internal consistency and scale reliability. It had excellent goodness-of-fit indices, similar to those of the established 19-item measure. Both versions correlated similarly with concurrent measures.

Conclusion The 6-item 1-factor MOS-SSS measures global functional social support with fewer items than the established 19-item measure.

Keywords Social support · Validation studies · Psychometrics · Women

Introduction

Growing evidence demonstrates the importance of social support for physical and mental health [1]. Perceived support, an individual's perception of the psychological and material resources derived from interpersonal relationships [2], is the most widely used theoretical approach to understanding social support because it focuses on self-report and does not assume that objectively measured social linkages will be considered supportive [3]. The 19-item Medical Outcomes Study Social Support Survey (MOS-SSS) [4] is commonly used to measure this construct providing a total score and four subscales.

The MOS-SSS was initially validated with 2,987 chronically ill adults [4]. Most subsequent studies have been among patients with health conditions [3, 5–10]. Two focused on carers of people with health conditions [2, 11], and two used community samples of 485 university students [12], and 4,444 community-based householders aged 55+ [13]. The scarcity of population-based samples may relate to a perception that a 19-item scale is too burdensome.

L. Holden · C. Lee
School of Psychology, University of Queensland, Brisbane,
QLD, Australia

L. Holden · R. Hockey · R. S. Ware · A. J. Dobson
School of Population Health, University of Queensland,
Brisbane, QLD, Australia

L. Holden (✉)
Centre for Longitudinal and Life Course Research, School of
Population Health, University of Queensland, Room 322, Public
Health Building, Herston Rd, Herston, QLD 4006, Australia
e-mail: l.holden@uq.edu.au

Large epidemiological studies often require brief valid measures to capture data on a broad range of issues. Three studies validating abbreviated 1-factor versions of the MOS-SSS have been published. However, none of these studies used a large community-based sample. One study used a sample of 330 mothers of children in mental health treatment [2] to validate 12-item and 4-item versions of the MOS-SSS. The other two studies used samples of people with chronic illness [7] or outpatients [5] to validate 8-item versions in English [7] and Spanish [5].

We propose an abbreviated 6-item 1-factor global measure of functional social support, suitable for population-based studies. We use two large nationally representative cohorts of Australian women of different ages (10,616 women aged 53–58 years and 8,977 women aged 28–33 years) to validate an abbreviated 6-item version (MOS-SSS-6).

Methods

Sample

Wave 4 data from the mid-age and younger cohorts of the Australian Longitudinal Study on Women's Health (ALSWH) were used. ALSWH is a prospective cohort study examining factors affecting women's health and health service use. Participants were randomly selected from the Australian universal health insurance database in 1996, with intentional over-sampling of women in rural areas. The mid-age cohort (born 1946–1951) comprised 13,715 women, of whom 10,905 (79 %) completed wave 4 in 2004. The younger cohort (born 1973–1978) comprised 14,274 women, of whom 9,145 (64 %) completed wave 4 in 2006. Comparison with 1996, national census data indicated that both cohorts were reasonably demographically representative of the national population in those age groups at wave 1 [14]. Participants gave written consent, and the study has ethical clearance from the Universities of Queensland and Newcastle.

Measures

The MOS-SSS was developed as a multidimensional self-administered measure of social support. A total score and four subscales (tangible support, affectionate support, positive social interaction and emotional/informational support) were validated [4]. Each of 19 items has a 5-point Likert response (ranging from: 'none of the time' = 1 to 'all of the time' = 5) assessing availability of different

kinds of support. The total scale was calculated by adding all responses (range 19–95).

Items in the MOS-SSS-6 were derived from the 3-factor structure found in exploratory factor analysis using wave 2 of the ALSWH mid-aged cohort ($N = 11,648$) [15]. This factor structure is consistent with the original 4-factor structure except that items from the original factors 'affectionate support' and 'positive social interaction' loaded strongly onto the same factor. For the MOS-SSS-6, the two items that loaded most strongly on each of the three factors were selected, except in two instances when an alternative item was selected because it was thought to better capture the construct being measured using language relevant to broader age groups. For example, 'Someone to have a good time with' had a slightly higher loading but 'Someone to do something enjoyable with' offered broader applicability. All selected items had loadings of more than 0.70. Subsequent confirmatory factor analysis of the 19 items with wave 4 of the mid-aged and younger cohorts supported the 3-factor structure [mid-age: Comparative Fit Index (CFI) = 0.96, root-mean-squared error of approximation (RMSEA) = 0.02; younger: CFI = 0.95, RMSEA = 0.02].

In the absence of any gold standard measure, we compared the 6-item and 19-item 1-factor versions by examining correlations with concurrent indicators of physical and emotional well-being: the SF-36 Mental Health Index (MHI) and SF-36 General Health Index (GH) (higher scores indicate better health) [16], optimism [Life Orientation Test—Revised (LOT-R)] (higher scores indicate greater optimism) [17], life satisfaction (higher scores indicate greater satisfaction), and loneliness, taken from a single item from the Center for Epidemiologic Studies Depression Scale (CESD-10) [18]: 'how often did you feel lonely during the last week', answered on a 4-point Likert scale ('rarely' = 1 to 'most or all of the time' = 4). In addition, we used two demographic measures: relationship status (partnered or not) and household composition (solo or not) as indicators of potential support availability.

Analysis

All data were analysed in Stata v13.1 (Statacorp, USA). Descriptive statistics including polychoric correlations are reported, along with Cronbach's alpha to assess internal consistency. To assess the abbreviated scale adequacy, we did confirmatory factor analysis (CFA) using structural equation modelling with the asymptotic distribution-free method and model fit indices: RMSEA, CFI, and standardized root mean square residuals (SRMR). Although the items are ordinal, it is considered acceptable to treat the

ordinal variables as continuous in confirmatory factor analysis when there are five or more categories and a large sample size [19].

To assess concurrent validity, Spearman's rank correlation coefficients were used to estimate correlations between MOS-SSS-6 and 19-item MOS-SSS; and between both MOS-SSS scales and other continuous measures (SF-36 MHI, SF-36 GH, and LOT-R). Polychoric correlations were used for MOS-SSS scales and loneliness, an ordinal variable. Bi-serial correlations were used for MOS-SSS scales and the binary variables, relationship status, and household composition.

Results

We excluded 289 (3 %) of the mid-age and 158 (2 %) of the younger cohort due to missing data on one or more of the 19 MOS-SSS items, leaving 10,616 and 8,977, respectively. All MOS-SSS-6 item median scores were 4 or 5 in a range of 1–5, showing the data to be highly skewed (Table 1). All 6 items correlated moderately well with each other. The median (25th and 75th percentiles) for the MOS-SSS-6 total score (range 6–30) was 26 (22, 29) for the mid-age cohort and 25 (20, 29) for the younger cohort. Cronbach's alpha was 0.81 and scale reliability 0.90 for the mid-

Table 2 Confirmatory factor analysis of the MOS-SSS-6 and the 19-item total score in both populations, using structural equation modelling with an asymptotically distribution-free estimation method

Psychometric property	Mid-age cohort (<i>N</i> = 10,616)		Younger cohort (<i>N</i> = 8,977)	
	19-item	6-item	19-item	6-item
Factor loading range ^a	0.56–0.90	0.55–0.89	0.56–0.90	0.56–0.87
RMSEA	0.03	0.03	0.03	0.05
CFI	0.94	0.99	0.94	0.97
SRMR	0.05	0.01	0.05	0.03

^a Standardized so that all variables, including latent variables, have a variance = 1

age cohort, and 0.70 and 0.89, respectively, for the younger cohort, demonstrating the internal consistency of the scale in both cohorts.

All items loaded well onto the 19-item total score measure and the 6-item measure, with similar factor loading scores for both measures in each cohort (Table 2). The model fit indices met the recommended goodness-of-fit criteria [20] in all models.

Concurrent validity is detailed in Table 3. Spearman's correlation was 0.97 between the MOS-SSS-6 and 19-item MOS-SSS for both cohorts. There were moderate

Table 1 Medians, 25th and 75th percentiles, and polychoric correlations for the six items of MOS-SSS-6 for the mid-aged and younger cohorts at wave 4 of the Australian Longitudinal Study on Women's Health

Items: (Someone to:...)	Median	25th and 75th percentiles	m4a	m4d	m4o	m4p	m4q	m4s
<i>Mid-age cohort (N = 10,616) (item response range 1–5)</i>								
m4a (help if confined to bed) (T)	4	4, 5	1.00					
m4d (take you to doctor if needed) (T)	4	4, 5	0.77	1.00				
m4o (share your most private worries and fears) (EI)	4	3, 5	0.54	0.64	1.00			
m4p (turn to for suggestions about problems) (EI)	4	4, 5	0.54	0.64	0.93	1.00		
m4q (do something enjoyable with) (P)	4	4, 5	0.56	0.66	0.95	0.81	1.00	
m4s (love and make you feel wanted) (A)	5	4, 5	0.56	0.64	0.78	0.76	0.83	1.00
	Median	25th and 75th percentiles	y4a	y4d	y4o	y4p	y4q	y4s
<i>Younger cohort (N = 8,977)</i>								
y4a (help if confined to bed) (T)	4	3, 5	1.00					
y4d (take you to doctor if needed) (T)	5	4, 5	0.78	1.00				
y4o (share your most private worries and fears) (EI)	4	3, 5	0.54	0.63	1.00			
y4p (turn to for suggestions about problems) (EI)	4	3, 5	0.55	0.65	0.92	1.00		
y4q (do something enjoyable with) (P)	4	3, 5	0.57	0.67	0.80	0.81	1.00	
y4s (love and make you feel wanted) (A)	5	4, 5	0.54	0.61	0.78	0.73	0.78	1.00

T, Tangible support; EI, emotional-informational support; P, positive social interaction support; A, affectionate support, indicating the factor in the four factor solution of the original 19-item MOS-SSS

Table 3 Correlations of total scores of MOS-SSS and MOS-SSS-6 with other characteristics, measuring concurrent validity of the MOS-SSS-6

	Mid-age		Younger	
	19-item	6-item	19-item	6-item
MOS-SSS 19-item ^a	–	0.97	–	0.97
MOS-SSS 6-item ^a	0.97	–	0.97	–
SF-36 MHI ^a	0.36	0.34	0.39	0.36
SF-36 GH ^a	0.24	0.23	0.27	0.25
Optimism (LOT-R) ^a	0.32	0.30	0.36	0.34
Life satisfaction ^a	0.52	0.50	0.48	0.46
Loneliness ^b	–0.46	–0.45	–0.51	–0.50
Marital status = partnered ^c	0.32	0.33	–0.30	–0.32
Living alone ^c	–0.28	–0.30	–0.21	–0.22

^a Spearman's correlation, ^b polychoric correlation, ^c bi-serial correlation

correlations with indicators of health and social connectedness, which were very similar for both versions.

Discussion

Data from two large population-based samples of women of different ages show the MOS-SSS-6 is a valid measure of social support. It has high internal consistency and correlates well with the original 19-item total MOS-SSS, indicating that the abbreviated scale is measuring the same underlying construct of global functional social support. It also shows the same moderate correlations with indicators of health and social connectedness as the 19-item measure, supporting this conclusion.

These findings are consistent with other validation studies of abbreviated versions of the MOS-SSS [2, 5, 7]. All three studies reported satisfactory goodness-of-fit statistics for their abbreviated total score. However, there were differences in the items included in these abbreviated measures. This study and the one by Gjesfeld [2] selected items based on factor structure derived from previous studies, whereas the other two studies selected the first eight items listed, which are predominantly 'tangible support' items [5, 7]. Despite these differences, all studies found satisfactory model fit for their abbreviated 1-factor measures. The merits of this 6-item measure are that item selection was based on a factor structure applicable to this sample and supported in other studies [6, 8] and that it was validated in two large nationally representative samples of women from different age groups making it suitable for population-based research.

One limitation of this study is that findings may not be generalizable to men. It could also be argued that item

selection should have been based on the original factor structure, but generalizability of this factor structure has been questioned in several studies [6, 8, 10, 11]. Similarly, instances where language and meaning have taken precedence over item loading may be criticized. However, condensing a 19-item measure to a 6-item measure requires careful consideration. A decision based purely on statistics may fail to select the item that best describes the construct in language applicable across age groups.

In summary, this study demonstrates that the MOS-SSS-6 measures the same global construct of functional social support as the 19-item total score, with considerably fewer items.

References

1. Umberson, D., & Montez, J. (2011). Social relationships and health: A flashpoint for health policy. *Journal of Health and Social Behaviour*, 51(S), S54–S66.
2. Gjesfeld, C. D., Greeno, C. G., & Kim, K. H. (2008). A confirmatory factor analysis of an abbreviated social support instrument: The MOS-SSS. *Research on Social Work Practice*, 18, 231–237.
3. Yu, D. S., Lee, D. T., & Woo, J. (2004). Psychometric testing of the Chinese version of the Medical Outcomes Study Social Support Survey MOS-SSS-C. *Research in Nursing & Health*, 27, 135–143.
4. Sherbourne, C., & Stewart, A. (1991). The MOS Social Support Survey. *Social Science and Medicine*, 32, 705–714.
5. Gomez-Campelo, P., et al. (2014). Psychometric properties of the eight-item modified Medical Outcomes Study Social Support Survey based on Spanish outpatients. *Quality of Life Research*, doi:10.1007/s11136-014-0651-6.
6. Lyons, S. J. (2010) *The role of social support and psychological resources in depression in people living with HIV/Aids: eExamining the mediating role of mastery and self-esteem*, in Graduate Department of Adult Education and Counselling Psychology. University of Toronto.
7. Moser, A., et al. (2012). The eight-item modified Medical Outcomes Study Social Support Survey: Psychometric evaluation showed excellent performance. *Journal of Clinical Epidemiology*, 65, 1107–1116.
8. Soares, A., et al. (2012). Validation of the Brazilian Portuguese version of the Medical Outcomes Study Social Support Survey in Hodgkin's lymphoma survivors. *Supportive Care in Cancer*, 20, 1895–1900.
9. Wang, W. et al. (2013) Psychometric testing of the Chinese Mandarin version of the Medical Outcomes Study Social Support Survey in patients with coronary heart disease in mainland China. *Quality of Life Research*.
10. Westaway, M. S., et al. (2005). The effects of social support on health, well-being and management of diabetes mellitus: A black South African perspective. *Ethnicity and Health*, 10(1), 73–89.
11. Shyu, Y.-I. L., et al. (2006). Psychometric properties of the Social Support Survey in a Taiwanese sample. *Nursing Research*, 55(6), 411–417.
12. Giangrasso, B. & Casale S. (2013) Psychometric properties of the Medical Outcomes Study Social Support Survey with a general population sample of undergraduate students. *Social Indicator Research*.

13. Robitaille, A., Orpana, H. M., & McIntosh, C. N. (2011). Psychometric properties, factor structure and measurement invariance of the English and French versions of the Medical Outcomes Study social support scale. *Statistics Canada*, 22(2), 1–8.
14. Lee, C., et al. (2005). Cohort profile: The Australian longitudinal study of women's health. *International Journal of Epidemiology*, 34, 987–991.
15. Australian Longitudinal Study on Women's Health (ALSWH). (2003). *The Australian longitudinal study on women's health: Report 20*. Brisbane: University of Queensland.
16. Ware, J., et al. (1993). *SF-36 Health Survey Manual and Interpretation Guide*. Boston: The New England Medical Centre.
17. Scheiver, M., Carver, C., & Bridges, M. (1994). Distinguishing optimism from neuroticism (and trait anxiety, self-mastery, and self-esteem): A re-evaluation of the life orientation test. *Journal of Personality and Social Psychology*, 67, 1063–1078.
18. Andersen, E. M., & Malmgren, J. A. (1994). Screening for depression in well older adults: Evaluation of a short-form of the CES-D. *American Journal of Preventative Medicine*, 10(2), 77–84.
19. Rhemtulla, M., Brioseau-Liard, P., & Savalei, V. (2012). When can categorical variables be treated as continuous? A comparison of robust continuous and categorical SEM estimation methods under suboptimal conditions. *Psychological Methods*, 17(3), 354–373.
20. Hu, L.-T., & Bentler, P. M. (1999). Cutoff criteria for fit indexes in covariance structure analysis: Conventional criteria versus new alternatives. *Structural Equation Modelling: A multidisciplinary Journal*, 6(1), 1–55.