

Validation of the ALONE Scale: A Clinical Measure of Loneliness

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Abstract

OBJECTIVES: This study aimed to examine the validity and reliability of a rapid, clinically administrable loneliness screening tool for older adults called the ALONE scale.

DESIGN: This was a cross-sectional study.

SETTING: Participants were recruited from either ambulatory clinics or a nursing home.

PARTICIPANTS: Participants were 65 years of age or older and had SLUMS scores of 14 or greater.

MEASUREMENTS: Construct validity of the 5-item ALONE scale was examined through correlation with the previously validated UCLA-20 Loneliness Questionnaire. Divergent validity for discriminating between loneliness and depression was examined through correlation with the PHQ-8 items. Test-retest reliability was assessed by correlation between baseline ALONE scores and those from re-administration in 2-3 weeks.

RESULTS: Among ambulatory clinic participants ($n=199$), the ALONE scale showed strong correlation with the UCLA-20 ($r=0.81$, $p < 0.001$). Similar correlation coefficients were seen among demographic subgroups: White Americans ($n=123$) ($r=0.81$, $p < 0.001$), Black Americans ($n=66$) ($r=0.79$, $p < 0.001$), adults ≥ 75 years ($n=74$) ($r=0.86$, $p < 0.001$). Among nursing home patients ($n=22$), the ALONE scale showed fair correlation with the UCLA-20 ($r=0.74$, $p < 0.001$). Test-retest of the ALONE scale showed a strong correlation ($r=0.89$, $p < 0.001$). ROC curve analysis determined ALONE scale scores of 8 and greater as optimal for severe loneliness screening.

CONCLUSION: This study shows that the ALONE scale has strong validity in assessing older adults for severe loneliness. The brief, comprehensible nature of the ALONE scale reduces adoption burden making it optimal for use in clinical settings.

Key words: Loneliness, reliability and validity, interpersonal relations, geriatric assessments.

One reason for this is that loneliness previously did not meet all of the Wilson and Jungner criteria required to warrant a screening test (5). Largely due to transportation constraints making interventions inaccessible, loneliness seemed to fail the criterion that a cost-effective treatment exists (6). However, the abrupt adoption of telehealth and spotlight on mental health secondary to the COVID-19 pandemic has resulted in initiatives centered on conducting loneliness interventions remotely (7-9). Thus, effective care for loneliness may be accessible to more older adults than ever before.

Loneliness measures commonly used in research studies, such as the 20-item UCLA loneliness scale and the 11-item de Jong Gierveld scale, have been available for decades, but the large number of items makes them impractical for clinical use (10, 11). Shorter versions of these scales are available such as the UCLA-3, but the scales avoid directly asking participants about loneliness to minimize self-presentation demands biasing patients' reporting (12). Self-presentation demands may be less of a concern in the clinical setting. Older adults seeking care are more likely to be forthcoming to a clinician in the context of a clinical visit when compared with the psychology research setting (13). Loneliness also carried great stigma during the 1980s when most loneliness scales were created, but stigma may have decreased in recent decades due to broader awareness of mental health (14). Thus, directly asking patients about loneliness could help set the agenda for a clinical visit and help facilitate dialogue during a clinical interview.

Saint Louis University clinicians created the 5-item ALONE scale to screen for loneliness in clinical settings (15, 16). It is designed to be a short and easily understood clinical tool. In this study, we seek to determine the validity and reliability of the ALONE scale as a loneliness screening tool among older adults.

Introduction

Loneliness is a distressing feeling linked to increased difficulty performing activities of daily living (1), increased risk for a variety of negative health outcomes (dementia, heart disease, and hypertension) (2), and increased likelihood of healthcare utilization (3). As restrictions ease from the COVID-19 pandemic, concern exists about a shift in societal norms towards decreased social contact potentiating an increase in loneliness prevalence (4).

Despite established negative health effects, no broad recommendation for loneliness screening among older adults has been made by the US Preventative Services Task Force.

Subjects and methods

The study was approved by the Saint Louis University Institutional Review Board. All participants were fully informed about the study and gave written consent.

Development of the ALONE scale

The ALONE scale was designed to screen for loneliness among older adults. The questionnaire was created based on current research studying loneliness and clinical experience of

Table 1. ALONE Scale

To assess an individual's perception of being lonely, ask each of the items below using the following rating scale: Yes (1), Sometimes (2), No (3).				
A	Are you emotionally Appealing to others?	Yes__	Sometimes__	No__
L	Are you Lonely?*	Yes__	Sometimes__	No__
O	Are you Outgoing/friendly?	Yes__	Sometimes__	No__
N	Do you feel you have No friends?*	Yes__	Sometimes__	No__
E	Are you Emotionally upset (sad)?*	Yes__	Sometimes__	No__

The items with an asterisk (*) are reverse coded.

geriatricians. ALONE consists of 5 items designed to evaluate the various correlates of loneliness (see Table 1).

Justification for individual ALONE items is as follows:

- The A-item asks about a participant's perception of self. Negative self-concepts have been linked to increased loneliness (17).
- The L-item directly asks whether an individual feels lonely. In contrast to the methodology of other questionnaires, directly asking about loneliness may help facilitate further discussion during the patient visit.
- The O-item asks about extraversion, which is a personality trait previously shown to be strongly linked to loneliness (18).
- The N-item asks about an individual's perception of adequate meaningful connections in their social network. This item specifically uses the term "friend," because friend support in contrast to support from family or close associates has been found to be the most reliable factor for predicting loneliness among older adults in nursing homes (19).
- Finally, the E-item asks about emotional stability, which is a factor inversely correlated with increased loneliness (18).

Study design and setting

We conducted a cross-sectional study of participants from two groups: patients visiting ambulatory clinics affiliated with the Saint Louis University School of Medicine (community-dwelling), and patients residing at a nursing home in the St Louis area. Both groups were a convenience sample of patients seeking medical care.

Patients were excluded if they were: younger than 65 years, unable to provide informed consent, non-conversant in English, or cognitively impaired as determined by Saint Louis University Mental Status (SLUMS) exam scores less than 14. Subjects were not offered incentives to participate in this study.

Materials

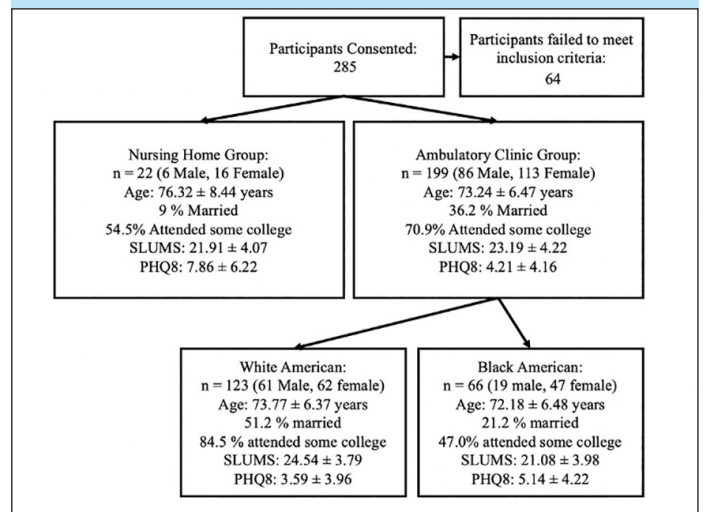
After written consent subjects completed the SLUMS exam (20) and a brief demographics questionnaire that included age, marital status, education, gender, race, and ethnicity.

Eligible participants completed the ALONE scale (See Figure 1). Responses are scored using a 3-point, verbally labeled, Likert-type scale. The total ALONE scale score is the sum of scores on the 5 items. Possible scores range from 5-15, with higher scores designed to indicate increased loneliness.

Items 2, 4, and 5 were reverse coded to combat respondent fatigue.

Subjects also completed revision 3 of the 20-item UCLA loneliness scale (10). The UCLA loneliness scale is a widely used unidimensional measure of loneliness showing significant correlation with other measures of loneliness (10). The UCLA loneliness scale is scored with a 4-point Likert type scale with possible scores that range from 20 to 80. Higher scores indicate higher levels of loneliness.

Figure 1. Flow chart of patient recruitment



To examine the relationship between the ALONE scale and depression, patients were asked to complete the PHQ-8, which is a widely used measure for major depression (21). The PHQ-8 has 8-items scored with a 4-point Likert type scale. Scores ranged from 0 to 24.

Procedure

Due to COVID-19 protocols aimed at reducing patient flow to clinical centers, only older adults with a scheduled clinical visit were asked to participate in the study. Subjects who agreed to participate were asked to complete the SLUMS exam, demographic questionnaire, ALONE scale and the UCLA loneliness scale. All questionnaires were administered verbally.

A subset of the participants (~20%) were re-administered the UCLA loneliness and ALONE scales via phone 2-3 weeks after initial enrollment to examine test-retest reliability.

Table 2. UCLA-20 and ALONE scale scores and correlations for various demographic subgroupings

	UCLA-20	ALONE	Pearson Correlation Coefficient
Total CD sample (n=199)	34.47 ± 10.404	6.81 ± 1.841	0.811
CD: Age 65-74 (n=126)	33.90 ± 10.53	6.71 ± 1.68	0.788
CD: Age 75 and older (n=73)	35.45 ± 10.17	6.99 ± 2.09	0.857
White CD Subjects (n=123)	33.86 ± 9.96	6.72 ± 1.78	0.813
Black CD Subjects (n=66)	34.83 ± 10.91	6.77 ± 1.74	0.788
Female CD Subjects (n=113)	33.90 ± 10.53	6.71 ± 1.68	0.841
Male CD Subjects (n=86)	35.45 ± 10.17	6.99 ± 2.09	0.764
Nursing Home Group (n=22)	35.45 ± 13.12	7.64 ± 2.237	0.741

Data analysis

Statistical analysis was performed using SPSS Statistics Version 28.0 (IBM Corp., Somers, NY). Descriptive statistics are reported as percentages for categorical variables and means ± standard deviations for continuous variables. Cronbach's alpha coefficient was used to measure internal consistency reliability. Convergent and discriminate validity ALONE scale versus the UCLA loneliness scale and PHQ-8, respectively, were examined using Pearson's product-moment correlation coefficient. Receiver Operator Characteristic (ROC) curves were computed to determine the ALONE scale cutoff score that optimized sensitivity and specificity for severe loneliness.

Results

Community-dwelling (CD) group

Of the 285 consenting subjects, 199 met inclusion criteria (see Figure 1). A greater portion of the population had a bachelor's degree (42%) compared to the national mean of 29% for older adults (22). A slightly lower percent of participants (40%) were married compared to the national mean of 53% (22). One hundred and twenty-three subjects (61.8%) self-identified as white and sixty-six subjects (33.2%) self-identified as black. ALONE and UCLA Loneliness scale scores for the total sample were 6.81 ± 1.84 and 34.47 ± 10.40, respectively. UCLA loneliness scales were similar to those reported among older adults (10).

Nursing Home Group

Of the 32 consenting subjects, 22 met inclusion criteria. ALONE and UCLA Loneliness scale scores were 7.64 ± 2.24 and 43.14 ± 13.12, respectively.

Convergent validity was assessed through comparison with the UCLA-20 which showed a strong Pearson correlation coefficient of 0.811 ($P < 0.01$) among the CD group. See Table 2 for correlation coefficients amongst participant subgroupings. Divergent validity was assessed through comparison with items of the PHQ-8. Items 2 and 6 of the PHQ-8 assess mood and self-concept, respectively, both of which are characteristics that have been linked to loneliness (23). These items correlated

more strongly correlated with the ALONE scale ($r = 0.572, 0.483$) than characteristics not associated with loneliness such as sleep, energy, and appetite ($r = 0.197, 0.328, 0.331$) (23).

Reliability analysis to measure the internal consistency of the ALONE scale items showed a Cronbach alpha score of 0.69. Although the alpha score was lower than the UCLA-20, it was similar to the 3-item UCLA-3 loneliness scale ($\alpha=0.72$) (23), and as such is sufficient to indicate the items of the ALONE scale reliably measure loneliness. Retest of the ALONE scale within a 2-3 week interval showed a correlation coefficient of 0.887 ($P < 0.01$) indicating strong test-retest reliability.

UCLA loneliness scale scores of 50 and greater have been used as a cutoff for severe loneliness (24). ROC curve analysis to optimize sensitivity and specificity, showed that ALONE scores of 8 and greater fit similar criteria for severe loneliness (sensitivity = 0.944, specificity = 0.855).

Discussion

The ALONE scale is a rapidly administrable loneliness screening tool designed for clinical use. This 5-item questionnaire demonstrated convergent and discriminant validity in measuring loneliness through comparison with the UCLA loneliness scale and the PHQ-8 items among both a community-dwelling population and a nursing home population. The ALONE scale exhibited strong test-retest reliability between phone and in-person scores. ALONE scale scores of 8 and greater may indicate severe loneliness based on the results of this study.

Limitations of this study include the small sample size ($n=221$), retest being conducted via phone, and the existence of multiple short loneliness screening tools. However, previous tools were created with use intended for psychology research settings. By directly asking about loneliness (L-item), and lack of significant social connections (N-item), the ALONE item allows clinicians to broach difficult topics, and set the agenda for a clinical interview with an older adult. Regardless of whether the ALONE or another scale is selected for use, standardization should be ensured within an organization by encouraging clinicians within the organization to use the same tool (25).

Even with the availability of many screening tools and a broad understanding of loneliness as a major health concern

among older adults, screening remains underperformed. In one study the prevalence of severe loneliness was cited as 20% among older adults (26). Despite the high prevalence, only 12.7% of clinics studied reported screening for social isolation (a closely related concept to loneliness) (26). Part of the issue may lie in adoption hesitancy due to perceived inconvenience of screening. In light of these concerns, NASEM has recommended including screening questionnaires in electronic-health-records software (25). The ALONE scale's short length makes it ideal for this use case.

The new light shone on the US healthcare system by the COVID-19 pandemic demonstrates a need for change in how loneliness is addressed. Loneliness is increasingly seen as within the scope of the medical field, and this paradigm shifts demands healthcare facilities optimize their workflow for tackling loneliness. Innovations in telehealth brought on by the COVID-19 pandemic could be paradigm shifting, but only if focus remains on identifying at-risk older adults. Like screening programs for other diseases, wide-spread screening to identify at-risk older adults followed by social prescribing of interventions could help address the loneliness epidemic.

Conflict of Interest: The authors have no conflicts.

Author Contributions: All authors approved the final version of the manuscript for publication. Ekamjit Singh Deol: conception and design, acquisition of data, interpretation of data, drafting and revising the manuscript. Kyla Yamashita: acquisition of data, revising the manuscript. Susan Elliott: acquisition of data, revising the manuscript. Theodore K. Malmstrom: conception and design, analysis and interpretation of data, drafting and revising the manuscript. John E. Morley: conception and design, analysis and interpretation of data, drafting and revising the manuscript.

Sponsor's role: There were no sponsors for this study.

Ethical standards: This study was approved by the Institutional Review Board of Saint Louis University and complies with all rules of the United States of America.

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