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Validation study on a Japanese version of the three-item UCLA Loneliness Scale among community-dwelling older adults

Dear Editor,

Loneliness, a major psychosocial predictor of health decline, is a form of subjective distress caused by a discrepancy between the social relationships people actually have and those they desire to have.¹ The global issue of loneliness has received particular attention in the UK, where social policies to address it have been stressed.² Numerous studies have been carried out to validate measures of loneliness, including the original and revised versions of the University of California, Los Angeles (UCLA) Loneliness Scale³ and its Japanese version.⁴

However, the large number of items contained in loneliness scales could make it impractical to apply them as self-administered questionnaire surveys, particularly in older adults who are at risk of health decline. Hughes *et al.* validated the three-item version of the revised UCLA Loneliness Scale, modifying the number of options from four to three; however, no validation study exists for its Japanese version.⁵ Our aim, therefore, was to validate the Japanese version of the three-item UCLA Loneliness Scale for community-dwelling older adults.

We obtained data from 537 respondents aged ≥65 years, living in large-scale public housing in Nagoya. Data were collected in 2018 through a self-administered questionnaire survey. We obtained permission from the primary investigators of the English three-item⁵ and Japanese 20-item version⁴ for utilizing the items and wording in those versions. The three items used in the present study had already been confirmed to have relatively high item–total correlations with the Japanese 20-item version,⁴ and high correlation with the revised UCLA scale (full version).⁵ Although we basically applied the translation by Masuda *et al.*,⁴ we slightly changed the wording of one item through back-translation by one of the co-authors (NC), who specializes in gerontological studies, and is also fluent in both Japanese and English (Doc S1).

We assessed Cronbach's alpha coefficients and item–total correlations for internal consistency for the scale and unidimensionality of the scale through principal component analysis. We also examined its convergent validity⁶ by replicating the findings of the associations between the loneliness scale and related variables observed in the previous validation studies.^{4,5} The variables assessed were: depressive symptoms as measured by a 15-item Japanese version of the Geriatric Depression Scale,⁷ self-rated health and social relationships. The study protocol was approved by the National Center for Geriatrics and Gerontology Ethics Committee (approval no. 854).

The total mean score was 4.30 (range 3–9; standard deviation 1.65), ranging between 1.33 and 1.62 for each item. The missing cases for each item were 11 (2.0%) at most. Cronbach's alpha coefficient was 0.84, with item–total correlations ranging between

0.85 and 0.89 (Table 1). Principal component analysis showed that the three items' loadings to the first component were between 0.81 and 0.91. The eigenvalue of this component was 2.31 (77.0% of the total variance), whereas it was less than one for the other component, confirming the unidimensionality of this scale.⁶

A *t*-test showed that the total score was significantly higher (Welch's *t* [428.02] = 2.233; *P* = 0.026) for men (4.49 ± 1.76) than women (4.16 ± 1.55), with no significant difference across age groups (*t* [521] = −1.19; *P* = 0.234), consistent with the previous study.⁴ The three-item loneliness scale was significantly correlated with the Geriatric Depression Scale, similar to the English version (*r* = 0.48, note: the study used a different depression scale)⁵ and the 20-item Japanese version (*r*_s = 0.52),⁴ of which the association with self-rated health was

Table 1 Correlation between loneliness scale and selected variables

| Variables (score range) | Coefficients | <i>P</i> -values |
|---|--------------------|------------------|
| Scale item 1: How often do you feel that you lack companionship? (1–3) | 0.85 [†] | <0.001 |
| Scale item 2: How often do you feel left out? (1–3) | 0.89 [†] | <0.001 |
| Scale item 3: How often do you feel isolated from others? (1–3) | 0.89 [†] | <0.001 |
| Geriatric Depression Scale (0–15) | 0.58 [‡] | <0.001 |
| Self-rated health (1–4) | −0.29 [‡] | <0.001 |
| Emotional support (received) (0–1) | −0.29 [‡] | <0.001 |
| Emotional support (provided) (0–1) | −0.22 [‡] | <0.001 |
| Instrumental support (received) (0–1) | −0.20 [‡] | <0.001 |
| Instrumental support (provided) (0–1) | −0.23 [‡] | <0.001 |
| Living alone (0–1) | −0.03 [‡] | 0.494 |
| Monthly face-to-face contact with children and relatives (0–1) | −0.02 [‡] | 0.608 |
| Monthly non-face-to-face contact with children and relatives (0–1) [§] | −0.15 [‡] | 0.001 |
| Monthly face-to-face contact with friends (0–1) | −0.28 [‡] | <0.001 |
| Monthly non-face-to-face contact with friends (0–1) [§] | −0.30 [‡] | <0.001 |

[†]Pearson's correlation coefficients show item–total correlations of the three-item loneliness scale. [‡]Spearman's correlation coefficients, used following the previous validation study,⁴ show the associations between the three-item loneliness scale and related variables. [§]Non-face-to-face contacts are those carried out by phone, letter, email and so on.

also similar ($r_s = -0.26$) to that in the present study. Correlation coefficients, showing the associations between loneliness and social support, were similar to the Japanese 20-item version (received emotional support $r_s = -0.18$).⁴ Although contact with friends, regarded as a selective relationship, was significantly, negatively associated with loneliness, those with relatives or living alone did not show a significant association (Table 1). These findings were consistent with the Japanese 20-item version, suggesting the association of loneliness with qualitative rather than quantitative social relationships.⁴

The present findings suggest the feasibility of the three-item UCLA Loneliness Scale for self-administered questionnaire surveys among Japanese older adults. Furthermore, our findings show high internal consistency, unidimensionality and convergent validity, confirming similarity in the association between the loneliness scale and related constructs in existing studies.^{4,5}

This newly validated loneliness scale will be implemented in a nationwide large-scale survey in 2019. Using the validated loneliness scale, we can examine cross-national comparisons and the association of loneliness with health consequences – a topic that has received limited attention in Japan, even though its risks have been broadly recognized in Western countries.⁸

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Disclosure statement

The authors declare no conflict of interest.

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Supporting information

Additional supporting information may be found in the online version of this article at the publisher's website:

Appendix S1. Japanese version of the three-item University of California, Los Angeles Loneliness Scale scale.

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Determining caregiver burden using new technologies for informal caregivers of people with dementia: A systematic review

Dear Editor,

We aim to systematically review evidence from the existence of caregiver burden using new technology for informal caregivers of

people with dementia. This review was carried out in accordance with the Preferred Reporting Items for Systematic Reviews and Meta-Analysis Statement.¹ The protocol was registered in the