

Development and psychometric evaluation of the loneliness inventory for older adults (Lonely): A mixed-methods study

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Abstract

Aim: To develop and initially validate the Loneliness Inventory for Older Adults.

Design: Scale development and evaluation.

Methods: This was a two-phase study. In phase 1, the initial items pool (126 items) was generated based on the concept analysis and literature review. Moreover, content validity was established by geriatric and psychometric experts. Phase 2 evaluated structural validity by performing item analysis, exploratory factor analysis and convergent validity. Reliability was evaluated by examining internal consistency, stability (ICC) and absolute reliability.

Results: Following the development process, 94 items were removed and a provisional version of the questionnaire with 32 items was subjected to psychometric evaluation. Three hundred and seventy older adults completed the questionnaire. After performing factor analysis, overall 3 items were removed due to low loading, and the questionnaire was reduced to 29 items tapping into five factors. The Cronbach's alpha for the instrument was 0.94, and the ICC value was 0.97.

KEYWORDS

development, loneliness, older people, psychometric, reliability, validity

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1 | BACKGROUND

At present, due to several reasons including socioeconomic developments and increased life expectancy, the world's elderly population is increasingly growing (Miremadi et al., 2020). According to World Population Prospects 2019, by 2050, 1 in 6 people in the world will be over the age of 65, up from 1 in 11 in 2019 (Kasai, 2021). As a result, the world will face serious issues about older people and solving their problems in the future. For instance, since the traditional family structure is changing rapidly, older adults might experience loneliness, which is a major problem for the mental and physical health of this population (Jiang & Fung, 2019; O'Suilleabháin et al., 2019).

Studies have repeatedly reported that up to one-third of older people experience some degree of loneliness late in life (Fakoya et al., 2020). The Stickley study reported that the prevalence of loneliness in older people in different European countries ranged from 3%–34% and in northern European countries such as Denmark, Germany, Sweden and the United Kingdom was lower than in Eastern and Southern Europe (Stickley et al., 2013).

In general, loneliness is a phenomenon that can occur in all age groups (Bandari et al., 2019) and its determinants could vary by age group and stage of life (Yanguas et al., 2018). Research on younger age groups has shown that personality traits are of primary importance (Hudson et al., 2012), while for the older adults, conditions such as having a partner and health status are the most prominent determinants of loneliness (Arslantaş et al., 2015). However, in examining the determinants of loneliness, we should specifically focus on older adults because younger people have a higher chance to manage loneliness for several reasons including usually living with family, good health status and more social activity and integration (Newall & Menec, 2019). Thus, old age itself seems to provide the basis for loneliness, or at least for older people, during which loneliness becomes more pronounced (Cohen-Mansfield et al., 2016). Loneliness is an unpleasant internal process and subjective phenomenon that occurs when a person's social network is significantly deficient in quality or quantity (Yanguas et al., 2018). Loneliness is different from being alone or living alone, so a person may suffer from loneliness even when there are many people around him. Conversely, people living alone may not feel loneliness (Smith, 2020).

As loneliness and inadequate social relationships have been previously linked with, for instance, increased risk of depressive symptoms (Cacioppo et al., 2010), coronary heart disease and stroke (Valtorta et al., 2016), and mortality (Holt-Lunstad et al., 2010), this demographic change combined with vulnerability to loneliness among older adults poses a significant societal and public health challenge. The risk of loneliness increases with age due to factors such as bereavement, decline in physical health, cognitive function and mobility and changes in living and socioeconomic circumstances, including living alone or in a nursing home (Aartsen & Jylhä, 2011; Fokkema et al., 2012; Hansen & Slagvold, 2016; Pinquart & Sorensen, 2001). Previous research also highlights the significance of declining and infrequent social participation as one of the risk

factors for loneliness in old age (Aartsen & Jylhä, 2011; Niedzwiedz et al., 2016).

Although there are a number of instrument to masses loneliness in older adults, a comprehensive measure is lacking. In addition, there are two other problems with such measures as follows: incomplete psychometric evaluation and applicability. One more problem with existing instruments is the fact that they, to some extent, are long. A chronological list of these instruments is provided in Table 1. However, it seems necessary to design and develop appropriate specific tools for screening and monitoring the health and loneliness of the elderly population. As recommended, such tools must be simple, comprehensible and easily applicable especially in clinical settings. In addition, as they should be more acceptable for and focused on the status of older people, they should be able to monitor and evaluate the changes in elderly loneliness more precisely (Bandari et al., 2020; Haywood et al., 2005). Thus, the present study was designed to develop a questionnaire to study loneliness among older adults and evaluate its validity and reliability.

2 | METHODS

A sequential exploratory mixed research was conducted in qualitative and quantitative phases in Tehran, Iran.

2.1 | Item generation

In order to generate items for the questionnaire, a review of the literature, and a qualitative study was conducted to form the concept of the loneliness in older adults. These are described as follows:

1. Review of the literature: A purposeful electronic search was carried out using PubMed' search engine and the CINAHL, Scopus, Web of Science, EMBASE and the AgeLine. Articles with keywords psychometric evaluation, measurement, 'concept', loneliness, home-sickness, old, old*, eld*, geriatric*, aging, age*, later life, senior, nonagenarian, octogenarian were retrieved in order to develop the concept of loneliness and to generate items for the questionnaire.

2. Qualitative study: Semi-structured interviews were conducted to elucidate determinates of loneliness among older adults as perceived by experts and older people. In doing so, eleven experts (nurses, general practitioners, psychiatrists, psychologists and gerontologists) and fourteen older adults (8 men and 8 women aged 60 years and over) shared and discussed their experiences. Purposive sampling with maximum variance (age, marital status, education, employment status, number of children, living condition, economic status and health status) was used to choose older adults from members of elderly health clubs affiliated to the Tehran municipality living in different districts of the city. Each interview lasted for about 45–70 min and was recorded and immediately transcribed verbatim. The transcribed text was read several times, and the codes were extracted (Graneheim & Lundman, 2004). The hybrid concept analysis method was performed to explore the data and synthesis

TABLE 1 A selected list of instruments that intend to measure loneliness

Author(s)	Year	Instrument (abbreviation)	Number of items	Strength and limitation
Schmidt & Sermat	1983	Differential Loneliness Scale (DLS)	60	Long, limited validity and reliability
Scalise et al.	1984	Loneliness Rating Scale(LRS)	40	Long, content focus more on neurosis and depression, rather than loneliness.
Wittenberg & Reis	1986	Wittenberg	10	Low internal consistency, non-significant relationship between items
De Jong Gierveld	1985	Loneliness Scale De Jong Gierveld	28	Mainly measures social loneliness satisfactory reliability, the only subscale that measures dimensions of loneliness is the deprivation subscale, with 7 items and a reliability value above 0.84.
DiTommaso & Spinner	1993	Social and Emotional Loneliness Scale(SELSA)	37	Relatively good psychometric properties, but it takes long time to be completed.
Russell	1996	UCLA loneliness scale (version 3)	20	This scale may represent a universal and useful scale for loneliness, but it strongly focuses on social loneliness and virtually ignores family loneliness.

the findings on three key issues including antecedents, attributes and consequences (Walker & Avant, 2019). Finally, a working definition was synthesized: "loneliness is an experience of older adults in the context of their individual and socio-economic characteristics that appears as disappointment, uselessness, reduced social capacity, psychological suffering, loneliness at certain times and dysfunctional interactions. This experience could lead to physical and mental problems, limitations, financial and cultural consequences."

3. Item pool: A total of 126 items were generated from the above-mentioned procedures. Of these, 35 items were derived from the literature review, 30 items derived from expert interviews and 61 items extracted from interviews with older people.

2.2 | Item reduction

At this stage, the research team evaluated items and merged the expressions with overlaps and excluded those items that seemed irrelevant. Thus, the initial version of the questionnaire with 94 items was subjected to the further item reduction process.

2.3 | Quantitative phase

In the phase of the study, a descriptive cross-sectional study was conducted to examine the psychometric properties of the questionnaire.

2.4 | Face and content validity

Ten older adults and 15 experts were asked to provide their comments on the inventory. The participants were selected using

conventional sampling. In this stage, the items were examined regarding face validity (Impact Score > 1.5), content validity ratio based on *Lawshe* table (CVR > 0.429) (Wilson et al., 2012), content validity index (Item Content Validity Index: ICVI > 0.78 & Scale Content Validity Index/Average: SCVI/Ave > 0.8) and Kappa value (Kappa > 0.74). Finally, the final decisions were made based on the indices mentioned above and comments collected from the research team on the deletion, modification and inclusion of the items. To calculate the Scale Content Validity Index (SCVI), we first calculated the ICVI value for each item in the inventory, and then, the mean of total ICVI was calculated for all items (Polit & Yang, 2015).

2.5 | Item analysis

In the item analysis phase, a preliminary study was conducted on 57 older adults before running factor analysis in order to initially assess the adequacy of the number of items and identify defective items. Participants were selected by conventional sampling. Items with the correlation coefficient between items lower than 0.3 were removed. Additionally, if Cronbach's alpha was increased with the removal of an item, it showed that the item should be deleted.

2.6 | Construct validity

In order to assess construct validity, the following procedures were performed:

1. Structural validity: Factor analysis is one of the best methods used to assess the construct validity. According to the rule of thumb, the sample size of 300 cases is generally considered good for factor analysis. Therefore, in this phase, 370 older adults who met the inclusion criteria (being aged 60 and older, no hearing and

vision deficit as per self-reports, no cognitive decline, obtaining a score of seven or higher in the Iranian version of the Abbreviated Mental Test by Foroughan et al., 2017, and willingness to participate in the study) were selected through convenient sampling, and exploratory factor analysis, maximum likelihood method and promax rotation were used to extract the latent factors. The maximum variability of the samples was considered from social and demographic characteristics.

2. Convergent validity (concurrent validity)

To assess the convergent validity, they were asked to simultaneously complete the final version of the study questionnaire and the UCLA Loneliness scale (version 3). This is a 20-item scale that was developed by Russell (Russell, 1996). It is used to measure a person's subjective feelings of loneliness. Each item on the scale is rated from 1 (Never) to 4 (Often) with a total score ranging from 20–80. The higher the score, the more severe the person's feelings of loneliness. This scale has good reliability with Cronbach's alpha of internal consistency ranging from 0.89–0.94 in the original scale (Russell, 1996) and 0.88–0.91 in the Iranian version (Dehshiri et al., 2008).

2.7 | Relative reliability

To determine the reliability of the measure, internal consistency, stability and absolute reliability were assessed. To measure the relative reliability, we assessed the Cronbach's alpha and the intraclass correlation coefficient (ICC). Internal consistency refers to the correlation between the items in a tool. For measuring the internal consistency, the alpha value of 0.7 or higher was thought (Boateng et al., 2018). In addition to estimate intraclass correlation coefficient (ICC), a sample of 50 participants completed the questionnaire twice with an interval of two-weeks. The correlation coefficient of 0.8 or higher was considered satisfactory (Polit & Yang, 2015).

2.8 | Absolut reliability

The standard error of measurement (*SEM*) and minimal detectable change (*MDC*) were calculated to measure absolute reliability. The following equation was used to calculate the standard error of measurement: $SEM = SD\sqrt{1-ICC}$. To calculate the *MDC*, we used the following equation: $MDC = SEM \times Z \times \sqrt{2}$. The *MDC* can be calculated as a percentage to determine the actual relative changes after treatment or between repeated measurements over time to further show the relative value of the random error of measurement. $MDC\% = (MDC \div \text{mean}) \times 100$, where the mean is the mean score of all repeated measurements (Lee et al., 2013). *MDC%* is acceptable if it is smaller than 30%, and the excellent *MDC%* value is assumed to be below 10% (Lee et al., 2013; Lyders Johansen et al., 2016; Polit & Yang, 2015; Wu et al., 2011).

2.9 | Interpretability

According to the COSMIN (Consensus-based standards for the selection of health measurement instruments) checklist, the benchmarks for the interpretability are calculating minimal important change (*MIC*), determining ceiling and floor effects, describing the distribution of total scores in samples, and determining the percentage of the missing items and the adequacy of the sample size (Mokkink et al., 2010). Thus, interpretability was examined using different approaches as follows:

a. Minimal important change-*MIC*: To calculate the minimal important change, we used the following formula: $MIC = 0.5$ (average effect size) \times the standard deviation of change score as derived from test-retest evaluations (Wright et al., 2012). The *MIC* must be higher than the *MDC* (Abbas et al., 2017).

b. The ceiling effect occurs when the majority of the respondents choose the upper limit of a scale, and the floor effect occurs when the majority of the participants choose responses that are at the lower limit of the scale (Lim et al., 2015). This index should be below 20% (Terwee et al., 2007). In this study, the ceiling and floor effects were also calculated as percentages for the total score of the instrument and the score obtained for all subscales to assess the discrimination power of the instrument and the distribution of responses.

c. The other method used to confirm the interpretability of the dimensions is to calculate the frequency of non-responded (missing) items. It is desirable if the value ranges between 15%–20% (Dong & Peng, 2013). One way to control the missing data is to replace them with the mean score (Kang, 2013). This alternative method was used. However, attempts were made to minimize the missing items through asking participants to share their experience by responding to all items as much as possible.

2.10 | Feasibility

Feasibility or ease of use is defined as the easy retrieval and practicality of an instrument in measuring the concerned construct (Polit & Yang, 2015). In this study, the frequency of the responses and the frequency of non-responded items were determined for each item, and an accurate factor analysis was run to avoid a lengthy inventory.

2.11 | Scoring

Each item is rated on a 5-point Likert scale (strongly disagree, disagree, neither disagree nor agree, agree and strongly agree). To calculate the total score for the inventory, the row score estimated by summing up all item scores giving a score ranging from 29–145. Then, the row score was transformed to a score range from 0–100 using the following formula where the higher score indicated higher loneliness.

$Transformed\ Scale = [Actual\ raw\ score - lowest\ possible\ raw\ score] / [Possible\ raw\ score\ range] \times 100$.

3 | RESULTS

3.1 | Item generation

Interviews with 16 participants led to the formation of 2,000 codes, 47 sub-themes and 9 themes. The themes included subjective phenomenon, health problems, decreased social capacity, inefficient interactions, experience loneliness at certain times, feeling abandoned and worthless, psychological suffering, disappointment and resilience. Finally, in this phase, an item pool with 94 statements was generated (first draft of the inventory).

3.2 | The main study: participants

In all, 370 older adults took part in the study. Of these, 205 (54.4%) were female, 69.2.0% ($n = 256$) were married, and 57.0% were retired. Most participants reported that they are living with wife/spouse (34.1%) and indicated themselves as having intermediate economic status (46.2%). The characteristics of participants are shown in Table 2.

3.3 | Validity

The content validity resulted in the exclusion of forty-seven items due to CVR values less than 0.42. By considering CVI values, 12 item was further deleted and the S-CVA/Ave of the loneliness inventory with 35 remaining-item was 0.85. Three items were revised in the qualitative face validity, and three items were removed in the quantitative face validity, due to impact scores less than 1.5. The remaining 32 items were subjected to further analysis.

3.4 | Item analysis

At this stage, the Cronbach's alpha was estimated to be 0.957, and no items were deleted.

3.5 | Factor analysis

The structural validity was evaluated using the exploratory factor analysis. To form the clusters, maximum likelihood method and promax rotation were performed. The Kaser-Meyer-Olkin (KMO) value was calculated to determine the adequacy of the sample size, and the Bartlett test for sphericity was used to check the item correlation matrix. The KMO value was found to be 0.92. In addition, the Bartlett's test for Sphericity had a value of 5,170.545 and was significant at 0.0001 level. The results indicated a five-factors solution that jointly accounted 56.64% of the total variance observed. However, at this stage due to low loading 3 items were removed, leading to a total of 29 items for the inventory. The results are shown in Table 3.

TABLE 2 The characteristics of study participants ($n = 370$)

	Number (%)
Gender	
Man	165(44.6)
Female	205(55.4)
Age group (years)	
60-70	261(70.5)
71-80	93(25.1)
80<	16(4.3)
Educational	
Illiterate	74(146)
Primary	100(27.0)
Secondary	112(30.3)
Higher	104(28.1)
Marital status	
Married	256(69.2)
Single	14(3.8)
Widowed	94 (25.5)
Divorced	6(1.6)
Employment status	
Housewife	127(34.3)
Employed	32(8.7)
Retired	211(57.0)
Number of children	
0	22(5.9)
01-Mar	182(49.2)
04-Jun	151(40.8)
>7	15(4.1)
Living condition	
Alone	73(19.7)
With spouse	126(34.1)
With children	49(13.2)
With family	117(31.6)
Others	5(1.4)
Economic status	
Poor	95(25.7)
Intermediate	175(47.3)
Good	100(27.0)
Housing	
Owner	300(81.1)
Tenant	60(16.2)
Children's home	6(1.6)
Living with relatives	4(1.1)
Health status	
Very Poor/poor	24(6.5)
Fair	150(40.5)
Good/very good	196(53.0)

TABLE 3 The results obtained from factor analysis of the loneliness inventory for older adults (Lonely)

Items	F1	F2	F3	F4	F5
I am even alone with my family members	0.854	0.017	0.100	0.160	0.214
I feel alienated from myself and others	0.813	0.002	0.134	-0.047	0.178
I have no one in my life to express sympathy	0.783	-0.071	0.160	0.128	-0.053
I do not travel with anyone	0.771	0.018	0.101	0.225	-0.055
I do not have the patience to talk or communicate with others	0.656	0.017	-0.163	0.103	0.307
I feel if I have reached a dead end	0.619	0.002	0.088	0.077	0.076
I have lost contact with friends	0.443	-0.071	0.051	0.199	0.241
I have lost my dignity	0.329	0.999	-0.150	0.271	0.120
I feel worthless as a person	0.218	0.941	-0.017	0.213	0.059
I have no companion	0.258	0.878	-0.053	0.107	0.095
I feel helpless	0.084	0.760	0.189	0.276	0.079
I feel frustrated	0.030	0.666	0.004	0.199	0.012
Others have abandoned me	0.094	0.638	0.248	0.271	0.095
I feel my life is empty and aimless	0.087	0.452	0.149	0.213	0.109
I feel homesick	-0.021	-0.004	0.884	0.107	0.165
I miss the past	0.322	0.124	0.857	0.276	0.329
I think about all my sufferings during my life	0.316	0.132	0.707	0.150	0.218
I became irritable.	0.321	0.142	0.583	0.017	0.132
I cry when I am alone	0.310	0.153	0.542	0.053	0.142
I get angry as others do not pay attention to me when I am talking.	0.324	0.100	0.474	0.189	0.109
My family members are so busy that they do not pay attention to me	0.135	0.211	0.473	0.004	0.165
I am dissatisfied with life	0.190	0.124	0.470	0.077	0.319
Autumn makes me feel loneliness more	0.113	0.187	0.135	0.980	0.218
The night makes me feel loneliness	0.248	0.167	0.168	0.815	0.132
I feel loneliness during the weekends, holidays or special occasions	0.272	0.186	0.212	0.598	0.142
I feel loneliness at sunset	0.212	0.155	0.144	0.470	0.109
It is difficult for me to communicate deeply with others	0.144	0.038	0.104	0.225	0.796
I feel alienated from friends and / or family	0.104	0.178	0.218	0.103	0.623
The death of friends and family makes me feel alone	0.168	0.149	0.258	0.077	0.414
Eigenvalues	11.61	3.15	1.75	1.26	1.15
% Variance	36.82	9.23	4.99	2.98	2.60

Note: Bolds are acceptable values for loadings for a given factor.

F1: Decreased social capacity, F2: Disappointment and uselessness, F3: Psychological suffering, F4: Experience loneliness at certain times, F5: Inefficient interactions.

3.6 | Convergent validity (concurrent validity)

To assess concurrent validity, the correlation between the Lonely and the UCLA loneliness scale was tested. The findings indicated a positive and significant correlation between the two measures lending support to its concurrent validity ($r = .58, p < .001$). The results are shown in Table 4.

3.7 | Relative reliability

As shown in the Table 5, the Cronbach alpha values obtained for each factor and the whole inventory were desirable. In addition, the ICC of 0.97 ranging from 0.90–0.98 were found for the whole scale and the subscales, respectively.

TABLE 4 The correlation between the loneliness inventory and the UCLA loneliness scale (version 3)

	UCLA	Disappointment and uselessness	Decreased social capacity	Inefficient interactions	Psychological suffering	Experience loneliness at certain times	Total
Disappointment and uselessness	.553 ^a	1					
Decreased social capacity	.487 ^a	.812 ^a	1				
Inefficient interactions	.380 ^a	.486 ^a	.757 ^a	1			
Psychological suffering	.372 ^a	.619 ^a	.639 ^a	.598 ^a	1		
Experience loneliness at certain times	.573 ^a	.647 ^a	.610 ^a	.569 ^a	.672 ^a	1	
Total	.587 ^a	.866 ^a	.904 ^a	.761 ^a	.860 ^a	.811 ^a	1

^aCorrelation is significant at the 0.01 level.

TABLE 5 Cronbach's alpha coefficient by dimensions and the whole inventory

Factor	No. of items	Cronbach's alpha	ICC
Disappointment and uselessness	7	0.92	0.98
Decreased social capacity	7	0.86	0.90
Inefficient interactions	3	0.74	0.92
Psychological suffering	8	0.86	0.97
Experience loneliness at certain times	4	0.83	0.96
Total	29	0.94	0.97

3.8 | Absolut reliability

Absolut reliability was assessed by calculating standard measurement error. Also, minimal detectable change (MDC) was estimated as explained. The results are shown in Table 6.

3.9 | Interpretability

Based on the following formula, for calculating the MIC, the standard deviation of the variations between the test-retest should be multiplied by the average effect size of 0.5 (Wright et al., 2012). $MIC = 0.5 \times SD$ of the Δ Score. The MIC must be higher than the MDC (Polit & Yang, 2015). Given that the standard deviation of the test-retest test score was 20.63, the value of 10.31 was obtained from the multiplication, which was higher than the MDC value (9.67). The ceiling and floor effects for the whole inventory were zero, and they were below 20% for the subscales, which are acceptable.

3.10 | Feasibility

A lengthy inventory was prevented by performing accurate factor analysis. The time to respond the inventory ranged between 10–15 min.

4 | DISCUSSION

This study was an attempt to design and psychometrically evaluate an instrument to measure loneliness in older adults. The initial questionnaire was developed based on data obtained from a qualitative study, expert opinions and extensive reviews of existing literature on loneliness in older adults. The designed questionnaire included a wide range of items to assess factors relating to loneliness in older adults. After the completion of the validity and reliability phases, loneliness inventory for older adults (Lonely) consisted of 29 items and five dimensions. The dimensions included measures of decreased social capacity, disappointment and uselessness, inefficient interactions, psychological suffering and experiencing loneliness at certain times. As most participants completed the questionnaire without any difficulties in approximately 15 min, we believe that the Lonely is an easy-to-use questionnaire that can be applied in future studies.

The first factor of the current inventory was the decreased social capacity. Studies have shown that physical limitations significantly increase loneliness in older people. In old age, physical health problems and poor functional status lead to limitations in a person's social contacts, which can lead to the loneliness. It is well documented that limited social capacity due to poor health can lead to continued loneliness (Perissinotto et al., 2012; Solanki, 2016).

TABLE 6 The Absolute reliability of loneliness inventory for older adults ($n = 50$)

Factor	Mean ^a	SD ^b	ICC ^c	CI ^c = 95% ^d	p-Value	SEM ^e	MDC ^f	MDC%	Result
Disappointment and uselessness	15.19	5.40	0.98	0.97–0.99	$p < .001$	0.756	2.09	13.75	Optimal
Decreased social capacity	16.58	5.83	0.90	0.80–0.95	$p < .001$	1.80	4.97	29.97	Optimal
Inefficient interactions	7.63	2.63	0.92	0.82–0.95	$p < .001$	0.736	2.03	26.60	Optimal
Psychological suffering	21.44	6.49	0.97	0.95–0.98	$p < .001$	1.10	3.04	14.17	Optimal
Experience loneliness at certain times	11.82	4.31	0.96	0.92–0.98	$p < .001$	0.862	2.38	20.13	Optimal
Total	72.66	20.63	0.97	0.95–0.99	$p < .001$	3.50	9.67	13.30	Optimal

^aPooled mean derived from mean value at first assessment plus mean value of the second assessment divided by two.

^bPooled standard deviation calculated similar to pooled mean.

^cIntraclass correlation coefficient.

^dConfidence interval.

^eStandard error of measurement.

^fMinimal detectable change.

The second factor, which consists of 7 items, refers to the disappointment and uselessness. Feelings of worthlessness and disappointment is very common in older people. Usually, many seniors have the feeling that they are not valued enough. In addition, since they feel the world is constantly changing, this led them to feel that their history was over (Holwerda et al., 2014; Ong et al., 2016).

The other factor in this inventory addresses the psychological suffering. This in fact could measure feeling bored, anxiety, depression, helplessness and low self-esteem caused by loneliness. Evidence suggest that this in itself deepen the pain and suffering of loneliness (Hauge & Kirkevold, 2012; Leary, 2015).

The loneliness at certain times was another concern among older people. Loneliness could be felt at certain times. During some specific times, seniors are more likely to feel more loneliness than ever. Such understanding might help to provide help and support as appropriate and perhaps use preventive strategies more effectively. It is important to consider certain times of the year, during which seniors need support. Indeed, focusing on primary health care and preventive strategies might be helpful (Stanley et al., 2010).

Inefficient interactions were another factor that contributed to the loneliness in older adults. Many seniors suffer from the loss of a beloved partner, or friends and acquaintances of the same generation. Having a caring family is very important to them, but unfortunately some seniors find that their family do not care about them as genuine interest. Studies have shown that lack of a sense of belonging in life plays an important role in loneliness (Prieto-Flores et al., 2011; Silverstein & Giarrusso, 2010). Our study found that most seniors were suffering from a lack of belonging to the important people in life, which puts them in a state of emptiness. In this case, a sense of meaninglessness prevails in the person that deprives older people of energy and motivation (Dahlberg et al., 2015; Singh & Misra, 2009).

The current study used a robust methodological and statistical approaches to provide a valid instrument for measuring loneliness. Perhaps looking at Table 1 could clearly indicate similarities and differences that exist among the Lonely and the other existing questionnaires. Previous instruments for measuring loneliness were very general and long and did not report adequate psychometric evaluations. Thus, we feel the current study is a major contribution to the filed. This was the first attempt to measure the loneliness in older adults in Iran. Future studies should be carried out among different age groups of older adults and in different environments. Perhaps the evaluation of such studies may lead to a stronger confirmation of the psychometric properties of the Lonely.

5 | LIMITATIONS

The most important limitations of this study was the fact that we collected the data during the COVID-19 epidemic and thus had limited access to older people. We had to collect a third of the sample through online data collection. Older people who are technically less intelligent were less likely to be present in this sample.

6 | CONCLUSION

The Loneliness Inventory for Older Adults (Lonely) is a valid and reliable instrument to measure the loneliness in older adults and can be used for future studies.

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CONFLICT OF INTEREST

The authors declare that they have no competing interests.

AUTHOR CONTRIBUTIONS

FMSH and HKH (study supervisors): Contribution to all aspects of the study. RB (the main investigator): Data collection and providing the first draft. AE (the study advisor): Study design. AM (Honorary advisor): Manuscript review and providing the final draft. AM and RB: Data analysis. All authors read and approved the final manuscript.

ETHICAL APPROVAL

The ethics committee of University of Social Welfare and Rehabilitation Sciences approved the study.

CONSENT TO PARTICIPATE

All participants signed informed consent form.

CONSENT FOR PUBLICATION


Not applicable.

DATA AVAILABILITY STATEMENT

The data used in this study are available from the corresponding authors.

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