

# The Revised Index for Social Engagement in Long-Term Care Facilities: A Psychometric Study

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## ABSTRACT

**Background:** Social engagement is known to be an important factor that affects the quality of life and the psychological well-being of residents in long-term care settings. Few studies have examined social engagement in long-term care facilities in non-Western countries.

**Purpose:** This study aimed to evaluate the validity and reliability of the revised index for social engagement (RISE), which was derived from the Korean version of the interRAI Long Term Care Facilities instrument.

**Methods:** Three hundred fourteen older adults from 10 nursing homes in Korea were included in the study. Convergent and discriminant validities were tested using correlation analysis and *t* tests, respectively. Factor analysis was adopted to examine the factor structure. The reliability of the RISE was tested using Cronbach's alpha values for internal consistency, and interrater reliability was tested using item kappa values and intraclass correlation coefficients.

**Results:** The RISE showed excellent convergent validity with the average time involved in activities ( $r = .58$ ). The known-group comparison showed a significant difference in the means of RISE between the group with cognitive impairment and the group without cognitive impairment, indicating satisfactory discriminant validity. Factor analysis showed a good model fit for two factors in the RISE: group involvement and interaction with others. The RISE showed satisfactory internal consistency ( $\alpha \geq .70$ ) and adequate interrater reliability ( $\geq .40$ ).

**Conclusions/Implications for Practice:** The RISE is a valid and reliable tool for measuring the social engagement of nursing home residents in Korea. Furthermore, this tool may be a useful instrument for assessing older ethnic Korean residents who reside in nursing homes that are located outside Korea.

## KEY WORDS:

social engagement, long-term care, reliability, validity.

## Introduction

Social engagement in long-term care (LTC) settings refers to being actively involved in meaningful activities or interactions with others in a social context (Gerritsen et al., 2008). Examples of activities to increase residents' social engagement include involving residents in everyday activities (e.g., washing dishes, preparing meals, or doing laundry) and

encouraging residents to formalized group activities. Studies have shown that those who are cognitively intact are more likely to participate in self-initiated activities, whereas those with less cognition are more likely to participate in staff or nursing-facility-organized activities (Zimmerman & Cohen, 2010). Studies have noted that intensive contact between residents and staff as well as the environmental stimuli in nursing homes (those stimuli related to real-world tasks and activities in particular) enhance the social engagement of residents significantly (Verbeek et al., 2014).

Social engagement has been consistently identified as an important factor that influences nursing home residents' quality of life and psychological well-being. Engagement in appropriate activities has been shown to increase happiness, decrease boredom, and improve quality of life in nursing home residents (Schreiner, Yamamoto, & Shiotani, 2005). Furthermore, engagement has been linked to a decrease in agitated behaviors in nursing home residents with dementia (Cohen-Mansfield, Libin, & Marx, 2007). Higher levels of social engagement have a long-term, protective effect on mortality in long-stay nursing home residents (Kiely & Flacker, 2003), whereas low levels of social engagement contribute to negative health outcomes, including loss of physical function and worsening depressive symptoms (Lou, Chi, Kwan, & Leung, 2013; Mor et al., 1995).

The index of social engagement (ISE) was developed in 1995 to measure the social engagement of older adults in nursing homes. The six items of the ISE resident assessment instrument/minimum data set include (a) interacting with others, (b) doing planned or structured activities, (c) doing self-initiated activities, (d) establishing own goals, (e) pursuing involvement in life of facility, and (f) accepting invitations to most group activities (Mor et al., 1995). The ISE has been applied in many studies of social engagement in nursing homes because of its satisfactory reliability and convergent validity with the time involved in activities (Phillips et al., 1997; Schroll, Jónsson, Mor, Berg, & Sherwood, 1997). However, two items (doing self-initiated activities and establishing own goals) in the ISE exhibited lower factor loadings

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(0.174–0.587) in comparison with other items (0.760–0.908) in the one-factor model (Mor et al., 1995).

Gerritsen and colleagues in the Netherlands conducted a validation study to improve the ISE in 2008. After conducting a comprehensive literature review and expert panel survey on social engagement, two items that did not seem to have a social orientation and had low factor loadings in the original study (“doing self-initiated activities” and “establishing own goals”) were dropped, and two new items that reflected improved social involvement were added (“initiates interactions with others” and “reacts positively to interactions initiated by others”); Gerritsen et al., 2008). Thus, the revised ISE (RISE) was developed with items that better related to the concept of social engagement. Unlike the one-factor model in the original study (Mor et al., 1995), the RISE identified a two-factor model. Two newly added items were extracted into one separate factor related to the quality of social interaction, and the other three items were loaded onto group involvement (Gerritsen et al., 2008). Moreover, the RISE showed increased reliability for residents with cognitive impairment (Gerritsen et al., 2008). The additional items that are necessary to calculate the RISE were included in the newest version of interRAI Long-term Care Facilities (interRAI LTCF) and interRAI Assisted Living. The RISE, developed in 2008, has been used in many studies on social engagement involving nursing home residents (de Rooij et al., 2012; de Rooij, Luijkx, Declercq, & Schols, 2011; te Boekhorst, Depla, de Lange, Pot, & Eefsting, 2009).

There has, however, been a dearth of research on social engagement for nursing home residents in countries whose cultural context and LTC systems differ from those in North America and Europe, where the RISE tool has been widely utilized (Lukas et al., 2013a, 2013b; Onder et al., 2012). Although South Korea has one of the most rapidly aging populations in the world, it has a short history of formal LTC provision. Thus, few studies exist on the effect of social engagement on quality of life in older adult residents of nursing homes. The current literature for LTC in Korea has focused mostly on the clinical aspects of the quality of LTC (Lee, Cho, & Jang, 2009; Yoon & Lee, 2010). Comprehensive and systematic evaluation tools to assess the essential physical, psychological, and social needs of older persons to improve the quality of life of nursing home residents are needed (Bernabei, Venturiero, Tarsitani, & Gambassi, 2000).

The Korean version of the interRAI LTCF was recently developed using a rigorous translation and back-translation process to ensure linguistic and cultural equivalence (Kim, 2013). Stakeholders and practitioners strive to meet social needs that have been ignored in nursing home care facilities. The Korean version of the interRAI LTCF allows these parties to assess diverse aspects to improve the quality of life of nursing home residents. However, although core subscales of the interRAI LTCF such as activities of daily living (ADLs), instrumental ADL (IADL), and pain have shown good psychometric properties (Kim et al., 2015), the psychometric properties of the RISE have not yet been examined.

To determine whether the RISE is applicable to measure nursing home residents’ social engagement in non-Western countries, this study was designed to examine the validity and reliability of the RISE tool in the Korean context.

## Methods

### Study Design

A cross-sectional design was used to test the psychometric properties of the RISE.

### Participants

Three hundred fourteen nursing home residents were selected randomly from rosters provided by 10 nursing homes that were located in three provinces (Seoul, Incheon, and Gyeonggi) in Korea. To evaluate interrater reliability, two regular staff members who cared for the same residents in each facility were asked to assess 200 of the 314 residents. This study was approved by the institutional review board for human subject research at Seoul National University (127-2011-0106).

### Instruments and Measures

#### *interRAI long-term care facilities*

interRAI LTCF is one arm of the instrument of the interRAI suite, which is an integrated family of 19 assessment instruments that were developed for a wide range of vulnerable populations across multiple settings (Hirdes et al., 2008). The interRAI LTCF is a specialized comprehensive geriatric assessment system for people who stay in LTC settings (Gray et al., 2009). The major domains of the interRAI LTCF address residents’ health and function status such as ADL, mood, problem behaviors, communication, and psychosocial well-being as well as the services provided to LTC residents (Mor, Finne-Soveri, Hirdes, & Gilgen, 2009; OECD/European Commission, 2013). In 2013, the interRAI LTCF assessment form and manual were translated into Korean, and the interrater reliability of the items was tested. More detailed information about this study is described elsewhere (Kim, 2013; Kim et al., 2015).

#### *Social engagement*

The six items on the interRAI LTCF of the RISE that related to social engagement were (a) interacting with others, (b) doing planned or structured activities, (c) accepting invitations to most group activities, (d) pursuing involvement in life of facility, (e) initiating interactions with others, and (f) reacting positively to interactions initiated by others. Each item was scored from 0 (not present), 1 (present but not exhibited in the last 3 days), 2 (exhibited 1–2 times in the last 3 days), to 3 (exhibited daily in the last 3 days). In calculating the RISE, scores of 0 and 1 were coded as “0” (not

present in the last 3 days), and scores of 2 and 3 were coded as "1" (exhibited in the last 3 days). As with the English version of the RISE, the RISE score was calculated as the sum of six dichotomous items, ranging from a possible total of 0 to 6, with higher scores indicating greater social engagement in the facility (Gerritsen et al., 2008). In the existing study, the RISE showed good psychometric properties using Dutch and Canadian data, with a Cronbach's alpha of .73 and interrater intraclass correlation coefficient (ICC) values for the scale from the two samples of .76 and .75, respectively (Gerritsen et al., 2008).

### **Average time involved in activities**

The average time involved in activities was selected to examine the convergent validity of the RISE. The average time involved in activities is a one-item measurement of the interRAI LTCF to identify those periods of a typical day (over the last 3 days) when the person was awake all or most of the time during normal hours and not involved in ADL care or treatment. The item was coded as 0 (none), 1 (little to less than one third of the time), 2 (some up to one third to two thirds of the time), and 3 (most to more than two thirds of the time).

### **Cognitive function**

Cognitive function was selected to examine the discriminant validity of the RISE (Cohen-Mansfield, Marx, Regier, & Dakheel-Ali, 2009). Cognitive function was measured using the cognitive performance scale (CPS). The CPS was derived from four items: two cognitive items (short-term memory and decision making), one communication item (ability to make oneself understood), and one ADL item (eating). On the basis of the algorithm that used these four items, CPS classifies nursing home residents into seven levels of cognitive function, ranging from 0 (intact) to 6 (very severe impairment). On the basis of this continuous CPS, residents were classified into either a cognitively intact group ( $0 \leq \text{CPS} \leq 2$ ) or a cognitively impaired group ( $3 < \text{CPS} \leq 6$ ; Morris et al., 1994). The CPS has been widely used with good psychometric properties, including high criterion validity with the Mini Mental Status Examination and Global Deterioration Scale and high reliability in terms of interrater reliability and internal consistency (Shin & Scherer, 2009).

### **Demographic variables**

Data on age, gender, marital status, length of stay, and chronic conditions were collected from the interRAI LTCF.

## **Data Analysis**

### **Validity**

We used confirmatory factor analysis (CFA) for the factor structure of the RISE. Before running the CFA, an exploratory factor analysis (EFA) was conducted because one item

of the RISE (i.e., at ease interacting with others) was double-loaded on two factors in the RISE development study (Gerritsen et al., 2008). The robust weighted least squares estimate and Geomin rotation were applied in the EFA. Next, the CFA was conducted to confirm the factor structure of the original RISE. Model fit indices for factor analysis included the  $\chi^2$  test, root mean square error of approximation  $\leq 0.08$ , comparative fit index  $\geq 0.95$ , and the Tucker-Lewis index  $\geq 0.95$  (Kline, 2010).

In addition, convergent and discriminant validity was investigated. Correlation analysis was used to examine the convergent validity of the RISE with the average time involved in activities. Correlation values  $\geq .45$  were considered substantial and high for convergent validity with a similar construct (DeVon et al., 2007). Given that the average time of activity involvement is a 4-point ordinal variable, the analysis of variance and Tukey post hoc test were additionally used to examine the convergent validity of the RISE with activity involvement. For discriminant validity, we used a *t* test to examine the difference in the RISE scores between the cognitively impaired resident group ( $0 \leq \text{CPS} \leq 2$ ) and the cognitively intact resident group ( $3 \leq \text{CPS} \leq 6$ ).

### **Reliability**

The Cronbach's alpha was computed to obtain the internal consistency levels for the whole scale and for each subscale. The cutoff point of the Cronbach's alpha ( $>.70$ ) shows excellent reliability (DeVon et al., 2007). The interrater reliability for each item was calculated using kappa statistics, and the interrater reliability of the RISE was calculated using an ICC with a two-way random model taking into account the continuous measurement. Following 1977), the extent of agreement using kappa values was evaluated as follows: *slight* = 0–.20, *fair* = .21–.40, *moderate* = .41–.60, *substantial* = .61–.80, and *almost perfect* = .81–1.0. An ICC of .40 or higher was considered to indicate adequate reliability, and an ICC of .70 or higher was considered to indicate excellent reliability (Fleiss, 1986).

Cognitive function was incorporated into the reliability analyses of the RISE, stratifying the sample population into two groups to assess reliability across cognitive functions. Factor analyses for the EFAs and CFAs were conducted using Mplus Version 7. The remaining analyses were conducted using SAS Version 9.4.

## **Results**

### **Sample Statistics**

Table 1 shows the demographic characteristics of the participants ( $n = 314$ ). Most the 191 residents in the sample were over 80 years old (61%). The sample was primarily female (76%), and 25% had a spouse or partner. About half of the sample (53%) had resided in the facility for more than 1 year, and 63% had received medical treatment or management for dementia or stroke. The scores for all

**TABLE 1.**  
**Sample Characteristics and Their Relationship With RISE (N = 314)**

	n	%	RISE			
			Mean	SD	F	p
Age (years)						
<70	24	8	1.7	2.3	1.81	.166
70 to <80	99	31	2.1	2.2		
≥80	191	61	1.6	1.9		
Gender						
Male	76	24	1.6	2.0	0.75	.386
Female	238	76	1.8	2.1		
Marital status						
With spouse or partner	78	25	1.3	1.9	5.30	.020
No spouse or partner	236	75	1.9	2.1		
Length of stay (months)						
<12	149	47	2.0	2.1	2.52	.082
12 to <36	90	29	1.6	1.9		
≥36	75	24	1.4	1.8		
Chronic conditions						
Dementia	117	37	1.6	2.0	0.37	.773
Stroke	64	21	1.9	2.2		
Dementia and stroke	35	11	1.8	1.8		
None of the above	98	31	1.8	2.1		

Note. Higher scores of RISE indicate higher levels of social engagement; Tukey test was used for the post hoc analysis. SD = standard deviation; RISE = revised index of social engagement.

demographic variables were similar for the RISE, with the exception of marital status variable, which indicated that nursing home residents who did not have a spouse or partner had higher scores for social engagement than those who did.

subsequent CFA confirmed the two-factor model (group involvement and interaction with others), with moderate model fits (comparative fit index/Tucker–Lewis index = 0.996/0.993, root mean square error of approximation = 0.112).

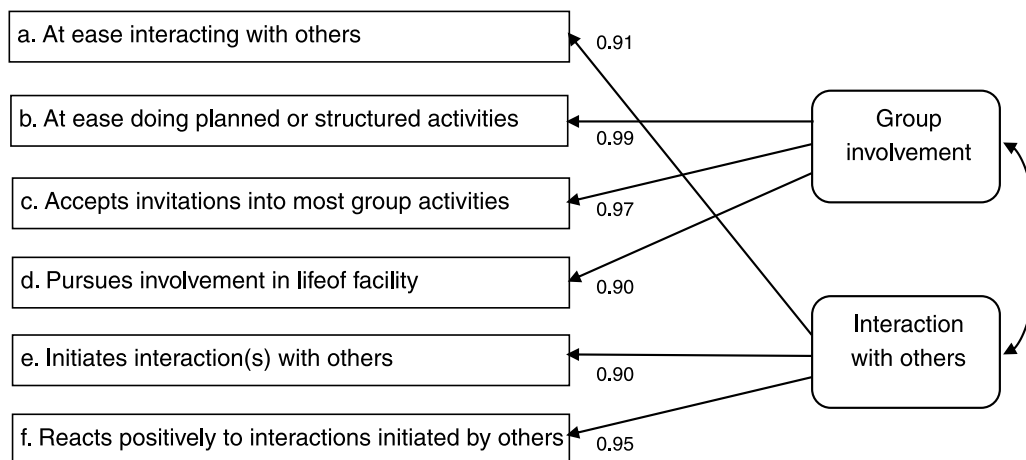
**Validity**

**Construct validity**

A two-factor model was identified in the EFA with a good model fit, showing that each item was clearly loaded on one factor with a factor loading > 0.4. As Figure 1 indicates, the

**Criterion-related validity**

A positive and statistically significant correlation was found between the RISE score and the average time involved in activities ( $r = .58, p < .0001$ ), indicating that the RISE had substantial levels of convergent validity. In addition, the means of the RISE increased as the time of activity involvement increased by the category in the analysis of variance



**Figure 1.** Confirmatory factor analysis of the revised index of social engagement (N = 314). Model fit:  $\chi^2/df = 39.315/8$  (p-value = .0000).

( $F = 54.49, p < .001$ ). Furthermore, Tukey post hoc analysis indicated the presence of significant mean differences across the categories. These findings further support the convergent validity of the RISE with the time of activity involvement (Table 2). A significant difference ( $p < .0001$ ) in mean scores of the RISE between the cognitively impaired resident group ( $0 \leq \text{CPS} \leq 2$ ) and cognitively intact resident group ( $3 \leq \text{CPS} \leq 6$ ) indicate fair discriminant validity, indicating that the RISE may differentiate between the social engagement of cognitively impaired older adults and cognitively intact older adults.

### Reliability

The Cronbach’s alpha values of all items for internal consistency of the RISE were .80 in the cognitively intact group and .86 in the cognitively impaired group, respectively. In addition, Cronbach’s alpha values for each factor were consistently greater than .70, regardless of the cognitive function. Table 3 shows satisfactory interrater reliability, indicating that the average kappa value for the six items was 0.83 for residents without cognitive impairment and 0.66 for residents with cognitive impairment. ICC values of the RISE scale were .94 for residents without cognitive impairment and .91 for residents with cognitive impairment.

### Discussion

Social engagement is a critical component for improving quality of life in people who reside in nursing homes. However, an appropriate instrument with good psychometric properties has not been developed for use in Korean LTC settings. Previously, the RISE showed good validity and reliability with 189 residents in Dutch and Canadian nursing homes. This study, using a larger sample ( $n = 314$ ), found the RISE to be a valid and reliable measure of social engagement in nursing homes in Korea, where the culture and LTC systems differ from those in Western countries.

The significant correlation between the RISE and the average time involved in activities indicates substantial convergent validity. The significant finding of the known-group comparison according to the cognitive impairment showed that the RISE provided discriminant validity to differentiate the social engagement by group based on cognitive function.

**TABLE 2.**  
**Convergent Validity (N = 311)**

Group	n	Mean	SD	Post Hoc (Tukey)
G0	97	0.46	0.97	
G1	114	1.40	1.89	G0 < G1, G2, G3,
G2	65	3.08	1.92	G1 > G2, G3
G3	35	3.94	1.95	

Note. RISE = revised index of social engagement; G0 = none; G1 = little (less than one third of the time); G2 = some (one third to two thirds of the time); G3 = most (more than two thirds of the time).

**TABLE 3.**  
**Interrater Reliability of RISE (N = 200)**

Item and Scale	Cronbach’s Alpha	
	No Cognitive Impairment (n = 97)	Cognitive Impairment (n = 103)
Items <sup>a</sup>		
a. At ease interacting with others	.87	.61
b. At ease doing planned or structured activities	.79	.73
c. Accepts invitations to most group activities	.81	.68
d. Pursues involvement in life of facility	.77	.67
e. Initiates interaction(s) with others	.85	.52
f. Reacts positively to interactions initiated by others	.86	.75
Average kappa	.83	.66
ICC of RISE scale <sup>b</sup>	.94	.91

RISE = revised index of social engagement.  
<sup>a</sup>Interrater reliability of each item was tested with kappa values. <sup>b</sup>Interrater reliability of the scale was tested using intraclass correlation coefficient (ICC).

The RISE tool clearly identified two factors: (a) the “group involvement” factor measures how residents responded to group activities in a facility, and (b) the “interaction with others” factor focuses on the quality of interpersonal interactions at the individual level. The CFA also showed high loadings for all six items on one factor with a moderate model fit. Particularly, the RISE development study showed that the first item, “at ease interacting with others,” did not clearly load onto one single factor (Gerritsen et al., 2008). However, in this study, this item loaded precisely on the factor “interaction with others,” whereas the remaining five items showed the same factor structure as the original study. Although Gerritsen et al.’s (2008) study did not discuss the possible reasons for the double-loaded item in the RISE, the item “at ease interacting with others” seems to be theoretically closer to the dimension of social interaction, which includes two other items: “initiates interactions with others” and “reacts positively to interactions initiated by others.” A larger study sample ( $n = 314$  in this study vs.  $n = 189$  in Gerritsen et al.) and lower measurement errors from assessors who were highly qualified registered nurses may help extract a clearer factor structure without double-loaded items. The results of the validity tests indicate that the RISE is a valid tool for measuring level of social engagement in nursing home residents.

The reliability, including the Cronbach’s alphas for all items and for the two subscale items, indicated satisfactory internal consistency regardless of cognitive function. The Cronbach’s alphas for all of the items in this study were

either .80 (no cognitive impairment) or .86 (cognitive impairment), which were higher than those identified in the RISE development study of .67 (no cognitive impairment) and .70 (cognitive impairment; Gerritsen et al., 2008). In addition, the average kappa and ICC values for the Korean-version RISE showed adequate to excellent interrater reliability regardless of cognitive function. This may be because of the high qualifications (mostly trained, registered nurses), strong general knowledge of resident assessments, and strong familiarity with the resident conditions of assessors, as assessors in Dutch nursing homes are usually licensed practical nurses with relatively low skill levels and professional training (Gerritsen et al., 2008). In particular, the interrater reliability for the cognitively impaired residents exceeded the level of significance, indicating that the RISE is a reliable instrument for assessing the social engagement abilities of cognitively impaired residents (Fleiss, 1986; Landis & Koch, 1977).

The RISE incorporates the assumption that social engagement is a fundamental aspect of living in LTC settings. Because of an increasing awareness of the importance of having a homelike care environment, enhancing social relationships, and engaging in meaningful life activities, social engagement has been increasingly emphasized in LTC programs in Korea (Koren, 2010). The psychometrically sound Korean-version RISE will be instrumental in addressing social engagement issues in older adults in Korean nursing homes. Furthermore, this instrument may be useful for assessing older Koreans who live in nursing homes outside Korea and who speak Korean. Clinically, the routine use of the RISE at an individual level will help staff monitor the status of residents over time. Monitoring the RISE scores of residents as a group may help in the development of group intervention programs that are designed to enhance social engagement at the unit or facility level. Finally, as the RISE has been found to be a valid and reliable tool for use with cognitively impaired residents, further studies using the RISE on more vulnerable populations are warranted to prevent social isolation and diminishing activities and to promote interaction with others in the care facility setting.

This study has several limitations. First, predictive validity and test-retest reliability were not evaluated because of the cross-sectional nature of the study design. Second, the sample may not be representative of all nursing home residents in Korea, as nursing homes were randomly selected from the official lists of nursing homes in only three provinces. Future studies that include nursing homes from rural areas may enhance the generalizability of findings. Third, this study examined convergent and discriminant validity using conventional methods (correlation analysis and *t* test) only. A more rigorous validity testing method using a multitrait-multimethod is recommended for future work.

## Conclusions

This study contributes to the scholarly literature on nursing homes by providing evidence related to the psychometric

properties of a useful tool for measuring social engagement in older residents. Our findings suggest that the RISE offers satisfactory reliability and validity when used in LTC settings in the non-Western country of Korea. Our findings further supported two subdomains—group involvement and interaction with others—under the main domain of social engagement. Because of the paucity of studies in Korea on social engagement, further studies using RISE are necessary to explore the extent of social engagement for nursing home residents and the factors related to social engagement at the individual and organizational levels. Moreover, cross-national studies on social engagement should be conducted for comparative evaluations of LTC quality. Culturally adapted and innovative interventions to improve social engagement should be developed, which may help improve the quality of life for older people residing in nursing homes.

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