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Reliability and Validity of the Resident Satisfaction Index in Assisted Living

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Abstract

Understanding satisfaction with assisted living (AL) from the residents' perspective is essential for creating supportive environments that are targeted toward the needs and desires of residents. Few measures have been tested to evaluate residents' satisfaction with AL. This study tested the reliability and validity of the Resident Satisfaction Index (RSI) in a sample of 501 AL residents. Based on Rasch analysis, there was support for item reliability and construct validity. Differential item functional (DIF) analysis was done to examine differences in item responses by age, gender, and cognition. Significant and substantive differences were identified for 5 items by gender, 1 item by cognition, and no differences were found by age group. Findings suggest the RSI is a reliable and valid measure to assess residents' satisfaction with AL and can be used to guide administrators and clinicians in making changes in these settings to increase residents' satisfaction.

Background

Assisted living (AL) is broadly defined as a residential care setting for older adults that provides personal care, 24-hour assistance, and social and health-related services (National Center for Assisted Living [NCAL], 2018). Currently, there are more than 835,000 adults in the United States who live in AL (Harris-Kojetin et al., 2016). AL settings are typically appropriate for individuals who need long-term custodial care or supportive care, but do not require skilled nursing care. Several studies have recognized the increasingly complex health

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issues of AL residents (Caffrey et al., 2012; Mitchell, 2013). The average AL resident is over 85 years old, widowed, and has multiple chronic conditions (Park-Lee et al., 2011). Four out of ten residents in AL require assistance with at least three activities of daily living and 42 percent have some level of cognitive impairment (Caffrey et al., 2012). In recent decades, there has been substantial growth in the AL industry due to an increase in the older population and a desire to age in place within supportive care environments (Stevenson & Grabowski, 2010).

AL settings are designed with specific principles embedded within their daily operations that promote resident autonomy, independence, privacy, and dignity (NCAL, 2018). With an emphasis on a resident-oriented philosophy of care, AL settings are the preferred long-term care option among the majority of older adults compared with nursing homes (Zimmerman et al., 2003). Despite the increasing demand and preference for AL, few measures are designed to assess whether residents are satisfied in these settings. Understanding satisfaction with AL from the residents' perspective is essential for creating supportive environments that are specifically targeted at the needs and desires of residents. This information is also important for AL owners and administrators, as resident satisfaction can have important implications on occupancy rates and residents' ability to age in place (Campbell, 2015).

Satisfaction with Assisted Living

Satisfaction with AL is a multidimensional concept that serves as an important indicator of the quality of care from the resident's perspective (Neugarten, Havighurst, & Tobin, 1961; Sikorska-Simmons, 2001). Perceptions of satisfaction are based on the individual comparing their current situation with expectations about the quality of a self-determined standard. Evidence suggests that in long-term care settings, satisfaction involves many components that are considered important to residents including meaningful relationships, social activities, homelike physical environment, adequate access to health care and positive interactions with care staff (Edelman, Guihan, Bryant, & Munroe, 2006; Mitchell, 2013; Rioux & Warner, 201; SikorskaSimmons, 2001; Street & Burge, 2012).

Additional factors that are associated with satisfaction with AL include resident and facility characteristics. Specifically, residents' gender, cognition, health status, and mood have been shown to influence their satisfaction with AL, such that those who are male, have more depressive symptoms, and are more cognitively or functional impaired have lower levels of satisfaction (Abrahamson et al., 2012; Mitchell, 2013; Resnick, Galik, Gruber-Baldini, & Zimmerman, 2010). Finally, organizational factors such as the facility size, profit status, amenities, and social programming are important predictors of residents' satisfaction with AL (Roberts & Adams, 2018; Shippee, Henning-Smith, Kane, & Lewis, 2015; Sikorska, 1999; Sikorska-Simmons, 2005).

Measurement of Satisfaction with Assisted Living

There are several benefits of monitoring and assessing residents' satisfaction with AL. Collecting and disseminating current information on residents' satisfaction with AL could

help to facilitate consumer choice. Choosing a long-term care setting is often challenging for older adults and their families, thus having information about residents' satisfaction would assist consumers in the selection process (Burge & Street, 2010). Publicly available satisfaction information provides feedback to facility administrators and policymakers to drive efforts in identifying problem areas and developing performance improvement strategies (Crystal et al., 2004; Wilson, 1996).

National and state-level efforts have been initiated in recent years to improve quality measurement in AL and across long-term care settings led by organizations such as NCAL, Center for Excellence in Assisted Living (CEAL), National Association of States United for Aging and Disabilities (NASUAD), Argentum and LeadingAge. Over the past decade, the NCAL has been committed to measuring quality in AL by collecting performance measures annually on a variety of indicators at the facility level including staff training and retention programs, hospital readmissions, and the use of antipsychotic medications (NCAL, 2015). The response rate for these annual surveys has been relatively low (less than 10 percent), however, and they did not incorporate the perspective of the residents or specific resident outcomes (NCAL, 2015).

A recent review of quality measures in AL found that resident satisfaction is an important measure of AL quality and measuring satisfaction is necessary to provide benchmarks for quality improvement (Shippee, Akosionu, Brasure, & Beebe, 2019). In 2016, the CoreQ was developed to measure the satisfaction of residents and their families across long-term care settings and has been used by facilities to assess performance in developing quality improvement strategies (Castle & Schwartz, 2017). The CoreQ survey for AL residents consists of four items measuring an overall rating of the facility, staff, care received, and food on a 5-point Likert scale. The development of CoreQ as part of the AHCA/NCAL Quality Initiative represents a major accomplishment in standardizing satisfaction measures across care settings and creating a platform for data tracking which can be used to compare facilities and improve the quality of care for residents. Although the CoreQ consists of only a limited number of items that are focused on AL quality in general, thus it is necessary to have more comprehensive measures specifically designed to evaluate residents' satisfaction which can be used to advance knowledge and inform interventions designed to improve satisfaction with AL.

There are a number of measures that evaluate satisfaction in the adult population. Unfortunately, some consist only of a single item such as, "Are you satisfied with life?" (Abrahamson et al., 2013; Andrews & Withey, 1976; Cantril, 1965), which does not take into account the multiple dimensions that make up the concept of satisfaction. Also, the majority of satisfaction measures were not designed for AL residents and thus may not contain items that are particularly relevant to the daily lives of residents in AL such as their perceptions of staff (Neugarten et al., 1961; Diener et al., 1985).

Currently, there are few published measures that are specifically focused on assessing residents' satisfaction with AL. The Assisted Living Resident Satisfaction Survey (ALRSS) is an 18-item survey measuring satisfaction with AL across the following subdomains: safety, personal attention, knowledge, autonomy, staffing, privacy, autonomy, and

socialization with family (Edelman et al., 2006). Similar to the ALRSS, the Resident Satisfaction Index (RSI) (Sikorska-Simmons, 2001) assesses the satisfaction of residents in AL across five subdomains that represent residents' perceptions of health care services, housekeeping services, physical environment, relationships with staff, and activities. For each subdomain, participants are asked to report their levels of satisfaction. Examples of items include, "Is the staff kind of caring?" and "Do you feel at home here?" The RSI is unique in that it includes items related to residents' satisfaction with health services and medical care provided at the setting. As the acuity of AL residents increases with more complex medical needs, measures of their satisfaction should consider residents' perceptions about the quality of health care services provided in these settings.

Pilot testing of the RSI used exploratory factor analysis in a small sample of residents from 13 AL settings and demonstrated evidence of internal consistency for each subdomain and the full measure (Cronbach's alpha overall of .92; subscales .77 to .86) as well as construct validity (Sikorska-Simmons, 2001). However, there has been no further psychometric testing of the RSI to our knowledge. Additional testing is needed to demonstrate further evidence of reliability and validity which could help to improve the measurement of residents' satisfaction with AL.

Therefore, the purpose of this study is to perform a detailed analysis of the psychometric properties of the RSI in a large sample of AL residents. This study expands on previous research by using Rasch analysis to evaluate the RSI which tests how difficult items are on the measure and can suggest potential areas that may need to be changed. In addition, this study uses Differential Item Functioning (DIF) analysis to examine whether there are differences in item responses on the RSI among subgroups of AL residents. Having a reliable and valid measure of residents' satisfaction with AL will help to inform changes in the service delivery and design of facilities to maximize residents' satisfaction and enable them to continue aging in place in these settings.

Methods

Design

This study used baseline data from the first and second cohorts of an ongoing randomized trial testing the dissemination and implementation of Function Focused Care in Assisted Living Using the Evidence Integration Triangle (FFC-AL-EIT) (Resnick, Galik, Boltz, Zhu, Fix, & Vigne, 2020). The FFC-AL-EIT study was focused on disseminating and implementing the Function Focused Care approach in AL to demonstrate that settings can adopt this philosophy and alter the care provided by direct care workers such that residents maintain or improve function and physical activity. The study was reviewed and approved by a University based Institutional Review Board.

Recruitment and Sample

Participants were recruited from 54 AL facilities in Maryland, Pennsylvania, and Massachusetts. Settings were invited to participate if they: (1) had at least 25 beds; (2) identified a nurse to work with the study team; and (3) were able to access email.

Assisted living residents were eligible for the study if they were 65 years of age or older, able to speak English, lived in a participating assisted living setting, and were able to recall at least one out of three words based on the Mini-Cog (Borson, Scanlan, Chen, & Ganguli, 2003). Residents were excluded from the FFC-AL-EIT study if they were enrolled in hospice at the time of recruitment because the study included a 12 month follow up visit, and thus hospice residents were not able to be in this secondary analysis. A five-item Evaluation to Sign Consent (ESC) questionnaire was used to guide the determination of residents' capacity to provide consent to research (Resnick, Gruber-Baldini, Aboff-Petzer, Galik, Russ, & Zimmerman, 2007). The items assure that the resident is aware of what is involved with participating in the research, can state what to do if they no longer want to participate in the study, and can identify the risks associated with the study. If the resident did not pass the ESC, he or she was asked to assent to the study and consent was obtained from the resident's legally authorized representative.

A total of 833 residents were approached for the study and 820 (98%) were identified as eligible based on age, ability to speak English, current residence, and not being enrolled in hospice. Of the eligible residents, 516 (63%) were consented into the study (251 in cohort 1 and 265 in cohort 2), 284 (35%) refused, and 21 (3%) were unable to provide assent and the legally authorized representative could not be reached. Following consent and cognitive testing, another 6 individuals (1%) were noted to be ineligible and 9 individuals withdrew after consent and prior to completion of baseline data leaving a final sample of 501 participants enrolled in the study.

Measures

Demographic and descriptive data were collected from participants' medical charts including age, gender, race, ethnicity, marital status, and level of education. Cognitive status was evaluated using the three-item recall on the Mini-Cog (Borson et al., 2003). The three-item recall consists of presenting three unrelated words to the participant. After a brief distraction, the participant is asked to recall the three words without cues and one point is awarded for each correctly recalled word. Those who were able to correctly recall all three words were classified as not cognitively impaired and those who recalled zero to 2 words were classified as cognitively impaired (Borson, Scanlan, Brush, Vitaliano, & Dokmak, 2000). Evidence suggests that the Mini-Cog has a sensitivity of 99% and specificity of 96% for correctly classifying dementia in a sample of community-dwelling older adults (Borson et al., 2000).

The RSI, as described above, is a 22-item measure of residents' satisfaction with AL (Sikorska-Simmons, 2001). For this study, residents' perceptions of housekeeping services were not included as housekeeping was not relevant to the aims of the FFC-AL-EIT study (Table 1). Items on the RSI were scored as agree or disagree and negatively worded items were reversecoded for scoring. Individual item scores were summed to create a total satisfaction score with higher scores indicating greater satisfaction with AL.

Data Analysis

All statistical analyses were done using the Winsteps statistical software program and SPSS Version 23. Descriptive analyses were done to describe the sample. Unidimensionality of the measure was tested using principal components analysis of the standardized residuals (Smith & Smith, 2004). Unidimensionality assumes that all items on an instrument measure a single underlying construct and accounts for the variation observed in the responses. For confirmation of unidimensionality, the variance explained by the first residual factor should be less than 10% with an eigenvalue lower than 2.0 logits indicating that less than 10% of the random variation in the standardized residuals is from a second dimension (Linacre, 2010). This is calculated by dividing the eigenvalue of the unexplained variance in the first factor by the number of items on the instrument times 100 (Smith & Smith, 2004).

Testing of reliability of the RSI was based on the Rasch measurement model and the item separation index (Smith & Smith, 2004). According to Rasch theory, people with medium ability should agree with the easier items and disagree with the more difficult items. Person reliability and item reliability coefficients range from 0 to 1 and are often interpreted similarly to that used for Cronbach's alpha. The item separation index, which ranges from 0 to infinity, defines how well items can be discriminated from one another on the basis of their difficulty along the measurement construct. The closer the reliability is to 1.0, the less the variability of the measurement can be attributed to measurement error. An equivalent to the alpha coefficient of .70 is considered acceptable evidence of item reliability (Smith & Smith, 2004).

Construct validity was tested based on how well the empirical data fit the Rasch measurement model. Item fit is based on INFIT and OUTFIT statistics which evaluate whether items on the instrument function logically and provide a continuum that is useful for all respondents. INFIT and OUTFIT statistics are based on conventional chi-squared statistics. The INFIT statistic is more sensitive to unexpected patterns of observations by individuals on items that are generally targeted to their ability. OUTFIT statistics are more sensitive to unexpected observations by individuals on items that are relatively easy or hard for them. Values ranging from 0.4 to 1.6 are considered acceptable (Smith & Smith, 2004; Wright & Linacre, 1994). In addition, the psychometric properties of the RSI were examined based on mapping of the items across the continuum of satisfaction and evaluation of the categorical responses for appropriateness.

DIF analysis was conducted to assess whether there were differences observed in item responses on the RSI among subgroups of participants (Tennant & Pallant, 2007). DIF analysis was based on the Rasch model and examined differences by sex (male versus female), age (less than 90 years old versus 90 years or older), and cognitive status (impaired versus not impaired). The cut point of 90 years old for comparing differences by age was established by using the median age of the sample. Cognitive status was differentiated into two categories, impaired and not impaired, based on the three-item recall scores on the Mini-Cog. Scores of 1 or 2 were categorized as impaired and scores of 3 were categorized as not impaired. Differences were determined based on the presence of both statistical significance, a probability score of <.05, and substantive significance, a difficulty contrast of >.5 logits (Linacre, 2010). We tested the null hypothesis that there would not be significant or

substantive differences in performance on the RSI across the identified subgroups. Rejection of the null hypothesis would indicate a potential for item response bias and require further investigation.

Results

As shown in Table 2, the sample included 501 participants from 54 AL facilities across three states. Participants had a mean age of 87.86 (SD= 7.27) and the majority were women (N=363, 72.5%), White (N=483, 96.4%), not Hispanic or Latino (N=495, 98.8%), and currently either widowed, divorced, or never married (N=383, 76.6%). On average, participants scored 2.40 (SD=0.77) for the three-item recall on the Mini-Cog. The mean total score on the RSI was 19.11 (SD=3.16).

Reliability and Validity

The unidimensionality of the RSI was examined using principal component analysis of the residuals. The unexplained variance, expressed in eigenvalue units, of the first contrast was 2.2. This indicates that only 10% of the variance was explained (2.2/22 items) by a second factor, which provides support for the unidimensionality of the measure (Smith & Smith, 2004).

Testing of the reliability suggested that there was evidence of internal consistency with an alpha coefficient of 0.95. There was also evidence of item reliability with an item separation of 4.54 indicating that items were well separated according to their difficulty. With regard to validity, there was evidence of fit for each of the items in terms of INFIT and OUTFIT statistics based on Rasch analysis as shown in Table 3. The INFIT statistics ranged from 0.81 to 1.33 and the OUTFIT statistics ranged from 0.49 to 1.55 which were all within acceptable range, suggesting that each item on the RSI fit the appropriate concept. Bivariate correlations for all items on the RSI are presented in Table 4.

Item mapping is provided in Figure 1. The item most likely to be endorsed in terms of residents' satisfaction with AL was item 10, referring to perceptions of staff's kindness. The next two items most likely to be endorsed were item 7 (general comfortability of the facility) and item 11 (courteousness of the dietary staff). Item 15 (satisfaction with personal assistance) was the next item most likely to be endorsed, followed by item 6 (satisfaction with the apartment/room) and item 13 (dependability of the staff). The next three items most likely to be endorsed were item 1 (staff's concern for resident health), item 3 (satisfaction with staff's skills), and item 4 (communication with staff). Items that were less likely to be endorsed included item 8 (homelike atmosphere) and item 21 (opportunities to make friends). Finally, item 17 (staff responsiveness) was the least likely item to be endorsed. There were 117 individuals (23%) in the sample that were so high in terms of residents' satisfaction scores that they could not be well differentiated.

Differential Analysis by Age and Gender

There were no significant or substantive differences in the difficulty of each item noted by age group.

There were significant and substantive differences identified for five items by gender. Item 16, "Do you see some staff treating residents in a rude way," was easier to endorse for males (dif= 0.54) compared with females (dif= −0.21, dif contrast= 0.66, p<0.05). Item 18, "Do you like the physical and social activities here," was easier for females (dif= 0.95) to endorse than for males (dif= 0.03, dif contrast= 0.93, p<0.01). Item 19, "Do you attend the physical and social activities" was easier for females (dif= 0.95) to endorse than for males (dif= 0.26, dif contrast= 0.69, p<0.05). Item 20, "Do you have opportunities to participate in activities" was easier for females (dif= 0.62) to endorse than males (dif= −0.14, dif contrast= 0.76, p<0.05). Item 22, "Do you have opportunities to participate in activities that are meaningful to you" was easier for females (dif= 0.80) to endorse than males (dif= 0.12, dif contrast= 0.68, p<0.05).

Differential Analysis by Cognition

There were significant and substantive differences by cognitive status on item 15, "Are you satisfied with the personal assistance you are getting here". Specifically, it was easier for those who were impaired (dif= −.52) to endorse this item than those who were not impaired (dif= −2.02, dif contrast= 1.50, p<0.01).

Discussion

Findings from this study provide support for the reliability and validity of the RSI. Specifically, there was evidence that the RSI is a reliable measure with sufficient internal consistency and reliability when used across subgroups of residents. There was support for the validity of the RSI in that the INFIT and OUTFIT statistics were all within acceptable range indicating that the items appropriately fit the construct. In addition, the point measure correlations were all positive and not near zero suggesting that there was no reason to reject any of the items.

The mapping of items suggests that the easiest item to endorse was in regards to residents' perceptions that staff are kind and caring. It is not surprising that having positive perceptions of care staff was important for residents' satisfaction with AL and is consistent with prior research (Abrahamson et al., 2013). Residents often develop close personal relationships with staff through daily care interactions which can affect a variety of resident outcomes such as physical function, psychological well-being, and quality of life (Kelly, 2012; Park, 2009; Resnick, Galik, Gruber-Baldini, & Zimmerman, 2011). Additional research should explore the quality of these care interactions across various service domains and how they impact residents' satisfaction.

The most difficult item to endorse on the RSI referred to staff's responsiveness to residents' needs. This may be because there is a wide range of needs among residents and heterogeneity in terms of staffing levels and types of services available across facilities (Caffrey et al., 2012; Park-Lee et al., 2011). Residents may have difficulty understanding and interpreting how to answer this particular question. Although the majority of participants reported being highly satisfied in this study, this may also indicate that staff are not adequately evaluating residents with regard to their personal needs and care preferences. Prior research indicates that residents in AL report having numerous unmet care needs

(Mitchell, 2013) and there are currently limited regulatory requirements regarding the delivery of person-centered care in AL. Assessing residents' unique preferences and needs in AL could be a strategy to improve the quality of care and satisfaction among residents.

The participants in this study reported a mean score of 19.11 (SD=3.16) out of 22 items on the RSI suggesting a high level of satisfaction with AL. This is consistent with previous studies demonstrating residents' satisfaction in these settings (Abrahamson et al., 2013; Resnick et al., 2010). This study used DIF analysis to examine how satisfaction scores differed across subgroups of AL residents by age, gender, and cognitive status. Our hypothesis that all subgroups would perform similarly on the RSI was partially supported, as there were differences noted on 6 items by gender and cognitive status. The items that displayed DIF are notable because they reflect different subscales on the RSI. In particular, all items that were most likely to be endorsed by females were part of the "Activities" subscale (items 18, 19, 20, 22) and only one item on that subscale (item 21) did not show DIF. This is not surprising considering that women tend to participate in a greater number of social activities compared with men in AL (Cummings & Cockerham, 2008). Further older females tend to enjoy and engage in more social activity than older males (Finkel, Andel, & Pedersen, 2018; Oshio & Oshio, 2012; Zhang, Feng, Lacanienta, & Zhen, 2017) whereas older males are more likely to engage in activities that are not considered social such as reading and exercise (Zhang et al., 2017).

In addition, two items on the "Relationships with Staff" subscale displayed DIF (items 15 and 16). Men were significantly more likely to endorse item 16 which referred to whether staff treat residents in a rude manner compared with women. In addition, those who were considered cognitively impaired were more like to endorse item 15 which referred to satisfaction with personal assistance. This may be because individuals with cognitive impairment tend to receive more assistance from staff with activities of daily living compared with those who are cognitively intact (Zimmerman, Sloane, & Reed, 2014). Prior studies have shown that persons with mild to moderate dementia can reliably rate their own perceptions of life satisfaction or quality of life, and that using a persons' self-report is often better than that of a proxy informant (Beer et al., 2010; Gräske, Fischer, Kuhlmey, & Wolf-Ostermann, 2012; St. John & Montgomery, 2010). In this study, only participants with mild impairment or intact cognition were included in the sample. Although participants were able to answer questions with interviewers, their responses may be variable depending on the situation. Approximately 42 percent of AL residents have some level of cognitive impairment (Caffrey et al., 2010). Thus, there is a need for additional research to examine the extent to which care needs are being met for AL residents with cognitive impairment, as this could be an important predictor of their satisfaction with AL.

In this sample of AL residents, there were a large number of individuals that scored so high on the RSI that they could not be differentiated. This suggests that more challenging items are needed to help differentiate between individuals. It may be helpful to add items relative to broader domains of life in AL (e.g., activities, physical environment, services). Examples of these items include asking about residents' satisfaction with specific types of activities (e.g., exercise class, group outings) or various aspects of the physical environment (e.g., outdoor areas, common spaces). Evidence suggests that common areas and designated

spaces for activities, café areas, and exercise facilities are important for promoting social engagement and physical activity (Andersson, Ryd, & Malmqvist, 2014; Zimmerman et al., 2007) and thus it may be important to consider including items about these specific areas. In addition, revisions of the measure should consider adding questions about whether residents perceive the care they receive as addressing their individual needs and preferences. Assessing residents' perceptions about person-centered care in AL can help to identify areas to improve care that will optimize their satisfaction in these settings.

Study Limitations and Conclusion

This study is limited in that it only included AL settings across three states from a single region of the country and there may have been some bias in the sample as these were all settings that agreed to participate in the parent FFC-AL-EIT study. In addition, the sample of residents was quite homogenous as the majority of the residents were women and non-Hispanic White and those with severe cognitive impairment or on hospice were excluded from the sample. Thus, the findings cannot be generalized to all AL settings or residents. Further testing is required to include a more heterogeneous sample. In addition, we were limited in exploring differences in performance on the RSI by cognition using the three-item recall on the Mini-Cog to measure cognitive status. Finally, this study only used baseline data collected at a single point in time, and thus a psychometric analysis of change scores on the RSI was not evaluated. Despite these limitations, this study provides additional information about the psychometric properties of the RSI. For valid decision making about strategies to improve residents' satisfaction with AL, there is a need for high quality satisfaction measures that have been empirically tested. Findings from this study could be used to support the continued use of the RSI in research and practice, particularly with the addition of more challenging items. Further research is warranted to evaluate the various factors impacting residents' satisfaction with AL to move toward the longterm goal of designing optimal care environments that best meet residents' unique needs and preferences.

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Measure in Logits	Person (Higher Ability)	Item (Easy)
6	##############	
		10
5		11 7
		15
		13 6
		1 3 4
4		20
		18 9 12 16 22
		14 19 2
	.##########	5
3		8 21
		17
	.#######	
	.	
2	.#####	
	.###	
	.	
	.##	
1	.	
	.#	
	.	
	.#	
0	.	
	.	
	.	
	.	
-1		
Measure in Logits	Person (Lower Ability)	Item (Difficult)

Figure 1.
Item Mapping by Person Ability and Item Difficulty
Note: '#' = 9 persons; '.' = 1 to 8 persons.

Table 1.

Resident Satisfaction Index (Sikorska-Simmons, 2001)

#	Item
Health Care	
1	Is the staff making every effort to keep you as healthy as possible
2	Do you think that you are not receiving the medical attention you need
3	Are you satisfied with skills of the staff you interact with
4	Do you feel you can talk to the staff if you have health or social concerns
Physical Environment	
5	Do you have a lack of personal space
6	Are you satisfied with your apartment/room
7	Is this facility a comfortable place to live
8	Do you feel at home here
9	Do you feel that there is a sense of community here
Relationships with Staff	
10	Is the staff kind and caring
11	Are the people who serve the food nice and courteous
12	Are you unhappy with staff's attitude or behaviour
13	Do you think you have dependable staff taking care of you
14	Do you feel that you have friends among staff members
15	Are you satisfied with personal assistance you are getting here
16	Do you see some staff treating residents in a rude way
17	Is the staff slow to respond to your requests
Activities	
18	Do you like the physical and social activities here
19	Do you attend the physical and social activities here
20	Do you have opportunities to participate in interesting activities
21	Do you meet residents here with whom you share similar interests
22	Do you have opportunities to participate in activities that are meaningful to you

Table 2.

Sample Description of Assisted Living Residents (N=501)

Variable	Total	Male	Female	Impaired Cognition	Intact Cognition	< 90 yrs old	< 90 yrs old
Satisfaction with AL, *M(SD)*	19.1 (3.1)	18.6 (3.2)	19.3 (3.1)	19.3 (2.9)	19.0 (3.3)	18.9 (3.4)	19.3 (2.8)
Age, *M(SD)*	87.8 (7.2)	86.9 (7.9)	88.2 (7.1)	88.7 (7.1)	87.2 (7.3)	-	-
Cognitive Status, *N(%)*							
Impaired	214 (42.1)	59 (42.8)	155 (42.7)	-	-	102 (37.4)	111 (48.1)
Intact	287 (56.5)	79 (57.2)	208 (57.3)			168 (61.5)	118 (51.1)
Gender, *N(%)*							
Male	138 (27.5)	-	-	59 (27.6)	79 (27.5)	79 (28.9)	59 (25.5)
Female	363 (72.5)			155 (72.4)	208 (72.5)	191 (70)	170 (73.6)
Race, *N(%)*							
White	483 (96.4)	135 (97.8)	348 (95.9)	202 (94.4)	281 (97.1)	258 (94.5)	223 (96.5)
Black	15 (3.0)	3 (2.2)	12 (3.3)	10 (4.7)	5 (1.7)	9 (3.3)	6 (2.6)
Ethnicity, *N(%)*							
Not Hispanic	495 (98.8)	135 (97.8)	360 (99.2)	214 (100)	282 (98.3)	264 (96.7)	229 (99.1)
Hispanic	5 (0.2)	3 (2.2)	2 (.6)	0 (0)	5 (1.7)	5 (1.8)	2 (.9)
Marital Status, *N(%)*							
Never married	48 (9.6)	21 (15.2)	27 (7.4)	17 (7.9)	31 (10.8)	28 (10.3)	19 (8.2)
Married	104 (20.8)	46 (33.3)	58 (16.0)	42 (19.6)	62 (21.6)	65 (23.8)	39 (16.9)
Widowed	293 (58.6)	57 (41.3)	236 (65.0)	133 (62.1)	160 (55.7)	142 (52)	150 (64.9)
Divorced	42 (8.4)	30 (8.3)	12 (8.7)	14 (6.5)	28 (9.8)	30 (11)	12 (5.2)

Table 3.

Rasch Analysis Fit Statistics for Resident Satisfaction Index

Item #	Item Description (abbreviated)	INFIT (z score)	OUTFIT (z score)	Observed Point Correlations	
				Corr.[*]	Exp.[*]
1.	Is staff making effort to keep you healthy	0.85 (−1.1)	0.71 (−1.3)	.41	.33
2.	Are you receiving medical attention you need	1.10 (1.3)	1.19 (1.5)	.39	.45
3.	Are you satisfied with the skills of staff	0.81 (−1.5)	0.71 (−1.3)	.44	.34
4.	Can you talk to staff about your concerns	0.92 (−0.6)	0.73 (−1.3)	.39	.34
5.	Do you have a lack of personal space	1.33 (4.5)	1.55 (4.6)	.30	.49
6.	Are you satisfied with your apartment/room	0.99 (0.0)	0.98 (0.0)	.32	.32
7.	Is this facility a comfortable place to live	0.88 (−0.6)	0.69 (−1.0)	.34	.28
8.	Do you feel at home here	1.06 (1.0)	1.10 (1.1)	.48	.51
9.	Do you feel that there is a sense of community	0.88 (−1.5)	0.87 (−0.9)	.49	.43
10.	Is the staff kind and caring	0.88 (−0.5)	0.49 (−1.4)	.30	.22
11.	Are the people who serve food nice and courteous	1.06 (0.4)	1.09 (0.4)	.26	.29
12.	Are you unhappy with staff's attitude/behavior	0.95 (−0.6)	0.87 (−1.0)	.48	.45
13.	Do you have dependable staff caring for you	0.82 (−1.3)	0.50 (−2.3)	.42	.31
14.	Do you feel that you have friends among staff	1.05 (0.7)	1.01 (0.1)	.44	.46
15.	Are you satisfied with personal assistance	0.93 (−0.4)	0.99 (0.1)	.32	.30
16.	Do staff treating residents in a rude way	1.06 (0.8)	1.08 (0.6)	.40	.43
17.	Is the staff slow to respond to your requests	1.13 (2.2)	1.18 (2.2)	.46	.53
18.	Do you like the physical and social activities	1.01 (0.1)	0.99 (0.0)	.44	.44
19.	Do you attend the physical and social activities	1.16 (2.0)	1.07 (0.6)	.38	.45
20.	Do you have opportunities to participate in interesting activities	0.89 (−1.2)	0.79 (−1.4)	.47	.41
21.	Do you meet residents here with whom you share similar interests	1.05 (0.8)	0.96 (−0.5)	.49	.51
22.	Do you have opportunities to participate in activities that are meaningful to you	0.92 (−0.9)	0.75 (−2.0)	.49	.44

[*] Note: Corr = correlated; Exp = expected.

Table 4

Bivariate Correlations for Items on Resident Satisfaction Index

Items	Health Care				Physical Environment							Relationships with Staff							Activities				
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22
1	1	.28**	.30**	.36**	.04	.15**	.16**	.17**	.36**	.24**	.19**	.31**	.32**	.13**	.25**	.22**	.25**	.15**	.03	.18**	.11*	.15**
2	.28**	1	.18**	.24**	.19**	.19**	.13**	.10*	.19**	.06	.05	.17**	.22**	.21**	.13**	.10*	.13**	−.02	.03	.13**	.03	.08
3	.30**	.19**	1	.29**	.10*	.26**	.32**	.26**	.31**	.27**	.04	.27**	.49**	.20**	.33**	.23**	.23**	.12*	.04	.32**	.11*	.18**
4	.36**	.24**	.29**	1	.10*	.11*	.18**	.20**	.33**	.18**	.14**	.15**	.30**	.24**	.23**	.12*	.14**	.07	.02	.14**	.11*	.16**
5	.04	.19**	.10*	.10*	1	.10*	.05	.04	.02	.07	.04	.13**	−.01	.07	.04	.14**	.07	−.01	−.03	.02	.04	−.03
6	.15**	.19**	.26**	.18**	.10*	1	.21**	.23**	.17**	.20**	.01	.23**	.27**	.12**	.19**	.17**	.11*	.10*	.04	.15**	−.01	.05
7	.16**	.13**	.32**	.18**	.05	.21**	1	.30**	.23**	.30**	.03	.13**	.33**	.18**	.28**	.09*	.12**	.12**	.05	.25**	.12**	.12**
8	.17**	.10*	.26**	.20**	.04	.23**	.30**	1	.32**	.08	.01	.16**	.25**	.15**	.10*	.10*	.16**	.15**	.13**	.21**	.19**	.19**
9	.36**	.19**	.31**	.33**	.02	.17**	.23**	.32**	1	.14**	.06	.22**	.30**	.20**	.20**	.11*	.16**	.27**	.20**	.28**	.22**	.24**
10	.24**	.06	.27**	.18**	.07	.20**	.30**	.08	.14**	1	.07	.26**	.31**	.15**	.33**	.14**	.12**	.17**	.06	.19**	.05	.14**
11	.19**	.05	.04	.14**	.04	.01	.03	.01	.06	.07	1	.31**	.09*	−.03	.19**	.25**	.14**	.09*	.05	.08	.12*	.19**
12	.31**	.17**	.27**	.15**	.13**	.23**	.13**	.16**	.22**	.26**	.31**	1	.32**	.07	.27**	.28**	.27**	.20**	.01	.14**	.08	.15**
13	.32**	.22**	.49**	.30**	−.01	.27**	.33**	.25**	.30**	.31**	.09*	.32**	1	.20**	.30**	.25**	.21**	.08	−.01	.25**	.06	.17**
14	.13**	.21**	.20**	.24**	.07	.12**	.18**	.15**	.20**	.15**	−.03	.07	.20**	1	.03	.08	.09*	.14**	.13**	.24**	.29**	.23**

Items	Health Care				Physical Environment					Relationships with Staff								Activities				
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22
15	.25**	.13**	.33**	.23**	.04	.19**	.28**	.10*	.20**	.33**	.19**	.27**	.30**	.03	1	.16**	.24**	.10*	-.06	.12**	-.01	.13**
16	.22**	.10*	.23**	.12*	.14**	.17**	.09*	.10*	.11*	.14**	.25**	.28**	.25**	.08	.16**	1	.20**	.09*	.01	.07	.11*	.19**
17	.25**	.13**	.23**	.14**	.07	.11*	.12**	.16**	.16**	.12**	.14**	.27**	.21**	.09*	.24**	.20**	1	.09*	-.01	.11*	.12**	.11**
18	.15**	-.02	.12*	.07	-.01	.10*	.12**	.15**	.27**	.17**	.09*	.20**	.08	.14**	.10*	.09*	.09*	1	.44**	.34**	.29**	.37**
19	.03	.03	.04	.02	-.03	.04	.05	.13**	.20**	.06	.05	.01	-.01	.13**	-.06	.01	-.01	.44**	1	.28**	.29**	.35**
20	.18**	.13*	.32**	.14**	.02	.15**	.25**	.21**	.28**	.19**	.08	.14**	.25**	.24**	.12**	.07	.11*	.34**	.28**	1	.29**	.48**
21	.11*	.03	.11*	.11*	.04	-.01	.12**	.19**	.22**	.05	.12*	.08	.06	.29**	-.01	.11*	.12**	.29**	.29**	.29**	1	.38**
22	.15**	.08	.18**	.16**	-.03	.05	.12**	.19**	.24**	.14**	.19**	.15**	.17**	.23**	.13**	.19**	.11*	.37**	.35**	.48**	.38**	1

**
Note: Correlation is signification at the .01 level;

*
Correlation is significant at the .05 level